Karyomorphological observations on some species of *Eria**

Kiyoshi Hashimoto** and Ryuso Tanaka***

エリア属数種の核形態学的観察

橋本清美・田中隆荘

Introduction

The genus *Eria* which is known as one of the large genera of the Orchidaceae with 400 species or more is distributed mainly in Southeast Asia and only three species occur in Japan (Hatusima 1975, Ohwi 1978). These species are known to be highly variable in external morphology, but taxonomically this genus is distinctly separated from the closely related genus *Dendrobium*. The chromosome numbers of *Eria* have been reported to be highly variable; 2n=36, 38, 40, 44 and 66 (Mutsuura & Nakahira 1958, Chardard 1963, Tanaka 1965, Pancho 1965, Sharma & Chatterji 1966, Mehra & Vij 1970, Terasaka & Tanaka 1974 and Mehra & Sehgal 1974), while those of *Dendrobium* have been reported to be 2n=36, 38 and 40 (Hashimoto 1981, 1982, Tanaka & Kamemoto 1982 and Jones *et al.* 1982). However, the morphological study of chromosomes in *Eria* is lacking in most standard references. The present paper deals with the karyomorphological observations in 18 species of *Eria*.

Materials and Methods

The species, the sources and the numbers of materials studied are shown in Table 1. These materials were grown in the Hiroshima Botanical Garden, Hiroshima City, Japan.

Nomenclature followed mostly Seidenfaden & Smitinand (1960) and some Holttum (1958), Hatusima (1975), Ohwi (1978), Liu & Su (1978) and Pradhan (1979).

Chromosomes were observed by the aceto-orcein squash method developed by Tanaka and Kamemoto (1960): Active root tips were cut into small pieces of 1.0–2.0 mm long and were immersed in 0.002 M 8-hydroxyquinoline for 4 hours at 16°C. They were then transferred to a modified Carnoy's solution (99% ethanol : chloroform : gracial acetic acid = 1 : 1 : 2) for 15 minutes at 16°C, hydrolyzed in lN HCl at 60°C for two minutes, transferred to 45% acetic acid for three minutes, squashed and stained in 1% aceto-orcein.

The chromosomes at mitotic metaphase were measured by lengths of long and short arms.

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** The Hiroshima Botanical Garden

*** Botanical Institute, Faculty of Science, Hiroshima University

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Table 1. Sources, chromosome numbers and number of clones of the species of *Eria* studied

Section	Species	Source	Chromosome number, 2n	No. of clones	Previous report, 2n
Trichotosia	*rufinula* Rchb. f.	Thailand	38	2	
Goniorhabdos	*corneri* Rchb. f.	Yakushima Isl. (Japan)	36	3	36 Tanaka 1965
		Amami Isl. (Japan)	36	1	
		Okinawa Pref. (Japan)	36	1	
	javanica (Sw.) Bl.	Thailand	36	3	
Dendrolirium	*ornata* (Bl.) Ldl.	Thailand	38	1	
Strongyleria	*pannea* Ldl.	Thailand	38	2	36* Mehra & Vij 1970
Cymboglossum	*stricta* Ldl.	Thailand	40	3	
Cylindrolobus	*coronaria* Rchb. f.	Thailand	36	1	36* Mehra & Vij 1970
	biflora Griff.	Thailand	46	1	
Urostachya	*floribunda* Ldl.	Thailand	38	1	44 Pancho 1965
	pachystachya Ldl.	Malaysia	38	1	
Hymneria	*acervata* Ldl.	Thailand	38	1	20 Mehra & Sehgal 1974
	bractescens Ldl.	Thailand	38	1	40 Sharma & Chatterji 1966
	graminifolia Ldl.	India	42	1	38* Mehra & Vij 1970
	hyacinsoides (Bl.) Ldl.	Malaysia	38	2	
	ovata Ldl.	Iriomote Isl. (Japan)	38	3	44 Pancho 1965
					36 Tanaka 1965
					36* Terasaka & Tanaka 1974
	reptans (Fran. & Sav.) Makino	Miyazaki Pref. (Japan)	38	1	40 Mutsuura & Nakahira 1958
		Yakushima Isl. (Japan)	38	1	38 Tanaka 1965
		Formosa	38	3	
	spicata (D. Don) Hand.-Mazz.	Thailand	38	1	38* Chardard 1963
					20 Mehra & Vij 1970
	tomentosiflora Hayata	Formosa	38	2	44 Pancho 1965

* counted from observation of mitosis in pollen or of meiosis in pollen mother cells

Arm ratio was calculated by length of long arm/length of short arm, and expressed by the value of arm ratio 1.0 to 1.7 as "median", 1.8 to 3.0 as "submedian" and 3.1 to 7.0 as "subterminal" according to Levan *et al.* (1964). The chromosomes were aligned in desending order and were given numbers 1, 2, 3, ...

Observations

Mitotic cell divisions were observed in the root tips of the investigated plants. Observations on chromosome morphology were made in the chromosomes at resting stage and at prophase and metaphase stages of mitosis.

The results of the observations in the 18 species were as follows:

1. *Eria rufinula* Rchb. f., 2n=38, Table 2 and Fig. 1. Validated specimen No. 3117.

Two clones were obtained from Thailand. External morphological characteristics of the clones were as follows: Pendulous stems were slender and leafy throughout their length. Leaves were lanceolate and covered with thick hairs. Inflorescence was not long and pendulous. Flowers were 8–10 mm long. Thus, this description is same as that of Seidenfaden and Smitinand (1960).

The chromosome number of *Eria rufinula* was examined in two clones to be 2n=38, which was a new report to this species.

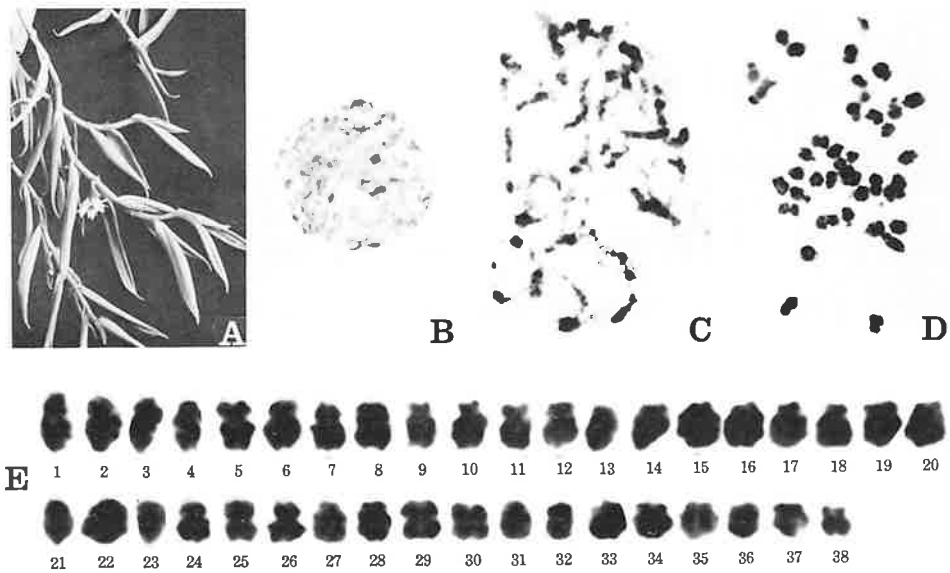

Fig. 1. Photomicrographs of the somatic chromosomes of *Eria rufinula*.
A. flowers. B, chromosomes at resting stage. C, chromosomes at mitotic prophase. D, chromosomes at mitotic metaphase, 2n=38.
A, × 0.2. B–D, × 1500. E, × 3000.

Chromosomes at resting stage were observed as chromomeric granules and fibrous threads scattered in the whole region of nucleus. Several spherical chromocentral blocks which varied in number from 6 to 10 per nucleus were observed in the resting nuclei. The chromocentral blocks were approximately 0.8 μm in diameter. At prophase the heterochromatic segments were located in the proximal regions and transformed gradually to euchromatic segments located distally. Thus, the karyotype at resting chromosomes was considered to belong to an intermediate category between the complex chromocenter type and the simple chromocenter type proposed by Tanaka (1971).

The chromosomes at mitotic metaphase showed the gradual variation of length ranging from approximately 2.5 μm to 1.3 μm, and the positions of centromeres were median, submedian and subterminal. Among the 38 chromosomes about 15 were median, 11 (Nos. 9, 10, 23, 24, 31, 33–38) were submedian and 12 (Nos. 11–20, 27, 28) were subterminal.

This species was found to show homogenous and a gradual type according to chromosome length and an asymmetric karyotype according to arm ratio.

2. *Eria corneri* Rchb. f., 2n=36, Table 3 and Fig. 2. Validated specimen No. 3082–3085, 3090.

Five clones were collected from three localities shown in Table 1. External morphological characteristics of the five clones were as follows: Stems transformed into the pseudobulbs which were 4-angled and on their apical regions had two oblanceolate leaves. One spike arose

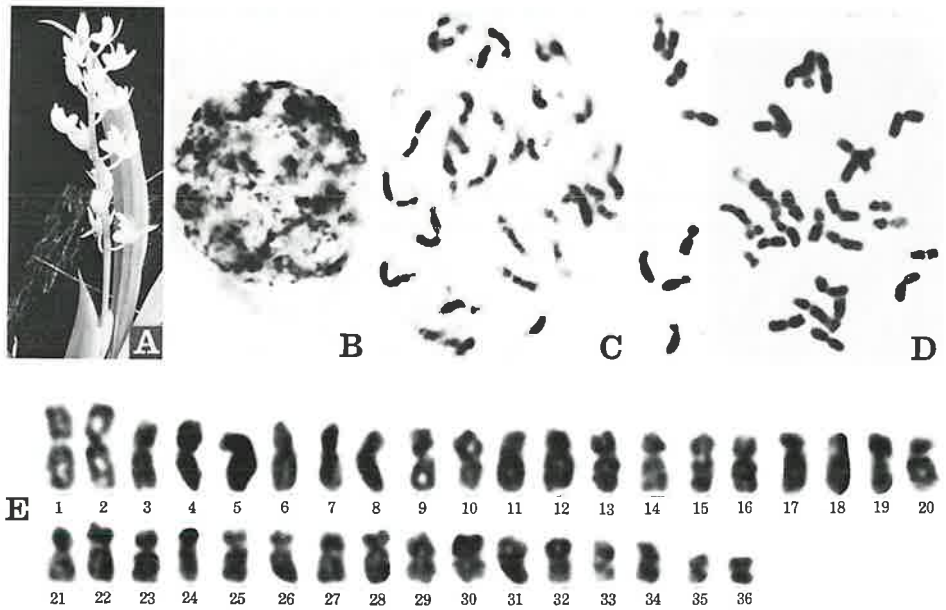

Fig. 2. Photomicrographs of the somatic chromosomes of *Eria corneri*.
A, flowers. B, chromosomes at resting stage. C, chromosomes at mitotic prophase. D, chromosomes at mitotic metaphase, 2n=36.
A, × 0.3. B–D, × 1500. E, × 3000.

from near the apex of pseudobulb and bore about 20 flowers of which color was greenish yellow. Thus, this description is same as that of Ohwi (1978).

The chromosome number of the five clones was examined to be 2n=36 which confirmed the previous report (cf. Tanaka 1965).

The chromosomes in the resting nucleus formed many chromomeric granules scattered in nuclear space. Some of the chromomeric granules formed chromocentral blocks which varied in number from 10 to 15 showing irregular margin. The chromocentral blocks were approximately 2.4 μm in diameter. At prophase the chromosomes formed early condensed long segments located proximally which transformed gradually into late condensed segments located proximally. A pair of the shortest chromosomes was found without picnotic segments. It was stained faintly and had median centromeres. Thus, the karyotype of the chromosomes at resting stage was considered to belong to the complex chromocenter type proposed by Tanaka (1971).

The chromosomes at mitotic metaphase were observed to be longer as compared to the chromosomes of *Eria rufinula* described above (p. 3). They varied in length gradually and ranged from 3.4 μm to 1.2 μm. The positions of centromeres of the complement were either median or submedian. Among the 36 chromosomes about 27 were median and nine (Nos. 17, 18, 20, 22–26 and 28) were submedian. The two longest chromosomes were 3.4 μm in length and had the centromeres in the median region, while the two shortest chromosomes were 1.2 μm in length and had the centromeres in the median region. The other 32 chromosomes ranging from 3.1 μm to 1.8 μm in length. The metaphase chromosomes were categorized to be heterogenous and a trimodal karyotype according to chromosome length and a symmetric karyotype according to arm ratio.

3. *Eria javanica* (Sw.) Bl., 2n=36, Table 4 and Fig. 3. Validated specimen No. 3093, 3094, 3097.

Three clones were obtained from Thailand. External morphological characteristics of the clones were as follows: Stems transformed into the pseudobulbs which were ovoid and had two lanceolate leaves on its apical region. Leaves were leathery and about 20–30 cm in length. Inflorescence was longer than the leaf and drooping. Flowers were sweetly scented and white with red spots on the lip. Thus, this description is same as that of Seidenfaden and Smitinand (1960).

The chromosome number of this species was examined in three clones to be 2n=36, which was a new count.

Chromosomes in the resting nuclei were found to be similar to those of *Eria corneri* described above (p. 4). That is, many chromomeric granules dispersed in the nucleus were observed. Some of the chromomeric granules formed many large chromocentral blocks which were loosely aggregated. They varied in size from 2 μm to 4 μm in diameter and showed irregular shape with rough surface. At prophase the chromosomes formed early condensed segments located in proximal and interstitial regions. In some chromosomes early condensed small segments were additionally found in the distal region. They early condensed segments were observed transforming gradually to the late condensed segments. Thus, the karyotype

at resting chromosomes were considered to belong to the category of the complex chromocenter type proposed by Tanaka (1971).

The chromosomes at mitotic metaphase were found to be similar to those of *Eria corneri*. The 36 chromosomes varied in length gradually and ranged from 4.6 μm to 2.4 μm. The positions of centromeres of the complement were median and submedian. Among the 36 chromosomes about 28 were median and eight (Nos. 5–8, 17–20) were submedian. The two longest chromosomes were distinct. They were 4.6 μm and 4.4 μm in length, respectively and both had the centromeres in median regions, while the four shortest chromosomes ranged from 2.6 μm to 2.4 μm in length and had the centromeres in median regions. The other 30 chromosomes ranged from 3.8 μm to 3.0 μm in length. Thus, the metaphase chromosomes were categorized to be heterogenous and a trimodal karyotype according to chromosome length and the category of a symmetric karyotype according to arm ratio.

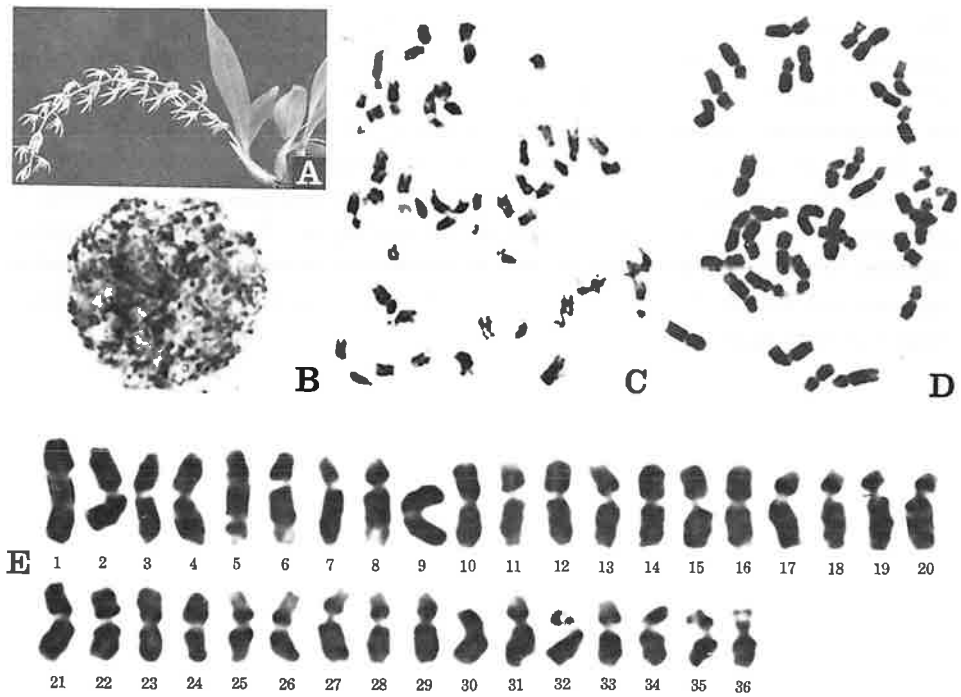

Fig. 3. Photomicrographs of the somatic chromosomes of *Eria javanica*.
A, flowers. B, chromosomes at resting stage. C, chromosomes at mitotic prophase. D, chromosomes at mitotic metaphase, 2n=36.
A, × 0.1. B–D, × 1500. E. × 3000.

4. *Eria ornata* Ldl. 2n=38, Table 5 and Fig. 4. Validated specimen No. 3121.

A clone was obtained from Thailand. External morphological characteristics of the clone was as follows: Large pseudobulb was about 10 by 4 cm in length and bore 4 to 5 leaves. Inflorescence covered with red-brown hairs was about 45 cm in length. The bracts were orange

in color and the flowers were greenish yellow. Thus, this description is same as that of Seidenfaden and Smitinand (1960).

The chromosome number of the clone was examined to be 2n=38, a new report to this species.

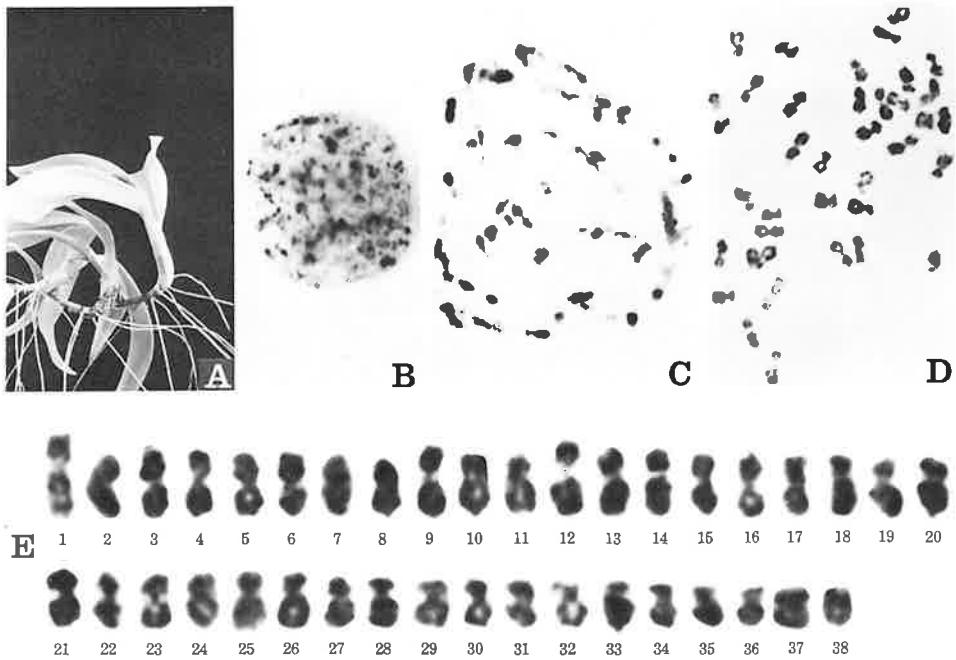

Fig. 4. Photomicrographs of the somatic chromosomes of *Eria ornata*.
A, seedling. B, chromosomes at resting stage. C, chromosomes at mitotic prophase. D, chromosomes at mitotic metaphase, 2n=38.
A, x 0.1. B–D, x 1500. E, x 3000.

The chromosomes at resting stage formed many chromomeric granules and fibrous threads scattered in the nuclear space. Many spherical chromocentral blocks which varied in numbers from 30 to 40 per nucleus were observed in the resting nuclei. The chromocentral blocks were approximately 0.8 μm in diameter. The chromosomes at mitotic prophase had early condensed large segments in the proximal regions, late condensed segments in distal regions, and gradually condensed segments in the interstitial regions. Thus, the karyomorphological features were found to be similar to those of *Eria rufinula* described in the previous paragraph (No. 1), with an exception of the shape of mitotic metaphase chromosomes. That is, chromosomes at metaphase were longer than those of *Eria rufinula* and showed the gradual variation of length ranging from 2.7 μm to 1.5 μm. The positions of centromeres were either median or submedian. Among the 38 chromosomes about 29 were median and nine (Nos. 1, 2, 14, 18–20, 25, 26, 32) were submedian.

This species was found to show homogenous and a gradient type according to chromosome length and a symmetric karyotype according to arm ratio.

5. *Eria pannea* Ldl., 2n=38, Table 6 and Fig. 5. Validated specimen No. 3087, 3101.

Two clones were obtained from Malaysia. External morphological characteristics of the clones were as follows: Erect shoots were well spread on the creeping rhizome and about 1.5 cm in length. Leaves were slightly flattened laterally and about 10 cm in length. Flowers were about 2 cm in width and pale yellowish green in color. Thus, this description is same as that of Holttum (1953).

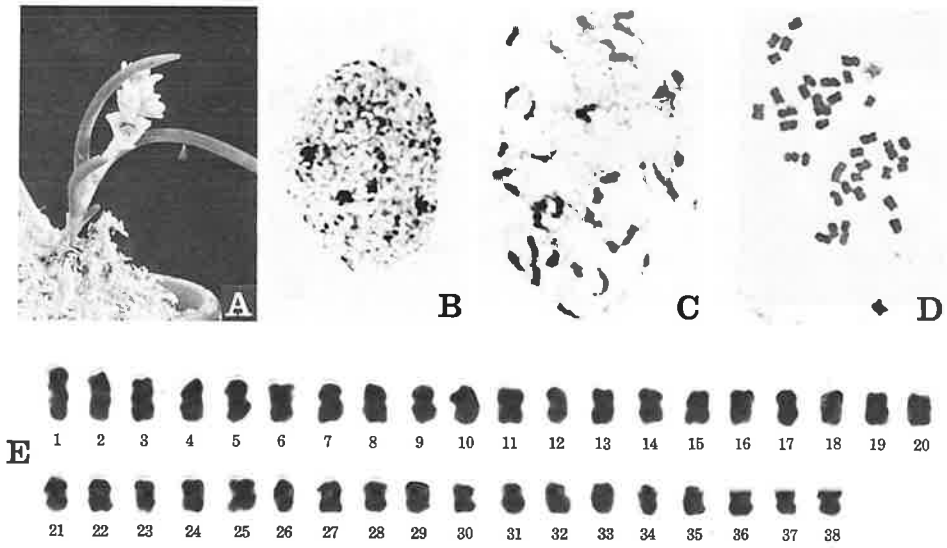

Fig. 5. Photomicrographs of the somatic chromosomes of *Eria pannea*.
A, flowers. B, chromosomes at resting stage. C, chromosomes at mitotic prophase. D, chromosomes at mitotic metaphase, 2n=38.
A, x 1.0. B–D, x 1500. E, x 3000.

The chromosome number of this species was counted to be 2n=38 at mitotic metaphase in the two clones examined, which was different from the chromosome number of n=18 in PMC's reported by Mehra (1970).

The chromosomes at resting stage formed many chromomeric granules and fibrous threads scattered in the whole region of nucleus. Several spherical chromocentral blocks which varied in number from 6 to 10 per nucleus were observed in the resting nuclei. The chromocentral blocks were approximately 0.8 μm in diameter. The chromosomes at mitotic prophase had early condensed large segments in the proximal regions, late condensed segments in the distal regions, and gradually condensed segments in the interstitial regions. Thus, the karyotype of the resting chromosomes was considered to belong to an intermediate category between the complex chromocenter type and the simple chromocenter type according to Tanaka's classification (1971).

The chromosomes at mitotic metaphase showed the gradual variation of length ranging from 2.3 μm to 1.0 μm, and the positions of centromeres were either median or submedian.

Among the 38 chromosomes about 34 were median and only four (Nos. 31–34) were submedian. The two longest chromosomes were distinct. They were 2.3 μm and 2.2 μm in length respectively, and both had the centromeres in the median region.

This species was found to have smaller chromosomes and showed heterogenous and a bimodal karyotype according to chromosome length and a symmetric karyotype according to arm ratio.

6. *Eria stricta* Ldl., 2n=40. Table 7 and Fig. 6. Validated specimen No. 3076, 3077, 3080.

Three clones were obtained from Thailand. External morphological characteristics of the clones were as follows: Pseudobulbs were erect, slender and about 10 cm long, with two leaves at near the apex. Inflorescence which bore about 30 small flowers arose from the top of stem and was erect. Flowers were distichous and about 0.3 cm in width. Thus, this description is same as that of Seidenfaden and Smitinand (1960).

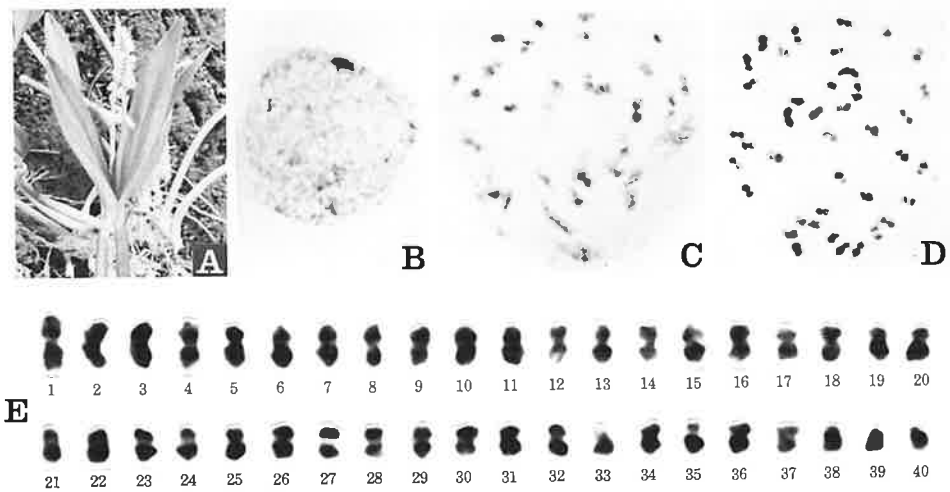

Fig. 6. Photomicrographs of the somatic chromosomes of *Eria stricta*.
A, flowers. B, chromosomes at resting stage. C, chromosomes at mitotic prophase. D, chromosomes at mitotic metaphase, 2n=40.
A, x 0.4. B–D, x 1500. E, x 3000.

The chromosome number of the three clones was examined to be 2n=40, a new report to this species.

The chromosomes at resting stage were conspicuous. They were observed as chromomeric granules and fibrous threads which were stained lightly. A few spherical chromocentral blocks which varied in size and number from 2 to 6 per nucleus were observed in the resting nucleus. The two largest blocks were approximately 0.8 μm in diameter. At prophase the largest blocks formed the heterochromatic segments of the longest mitotic chromosomes. Including the largest blocks, all of the heterochromatic segments were located in the proximal regions and

transformed gradually to euchromatic segments located distally. Thus, the karyotype of the resting chromosomes was considered to belong to the category of the simple chromocenter type according to Tanaka's classification (1971).

The chromosomes at mitotic metaphase showed the gradual variation of length ranging from 2.2 μm to 1.0 μm, and the positions of centromeres were median, except for two (Nos. 35, 36) submedian chromosomes.

Among the species described in this paper, this species was found to have a distinct chromosome number and showed homogenous and gradual type according to chromosome length and a symmetric karyotype according to arm ratio.

7. *Eria coronaria* (Ldl.) Rchb. f., 2n=36, Table 8 and Fig. 7. Validated specimen No. 3086.

A clone was obtained from Thailand. External morphological characteristics of the clone was as follows: Pseudobulb was about 10 cm long and had two leaves at apex. Leaves were coriaceous and lanceolate. Inflorescence was terminal and set 2–8 flowers. Flowers were fragrant, yellowish white in color and about 2.5 cm in width. Thus, this description is same as that of Seidenfaden and Smitinand (1960).

The chromosome number of this species was counted to be 2n=36 in all of the well spread mitotic figures, which confirmed n=18 in PMC's reported by Mehra & Vij (1970).

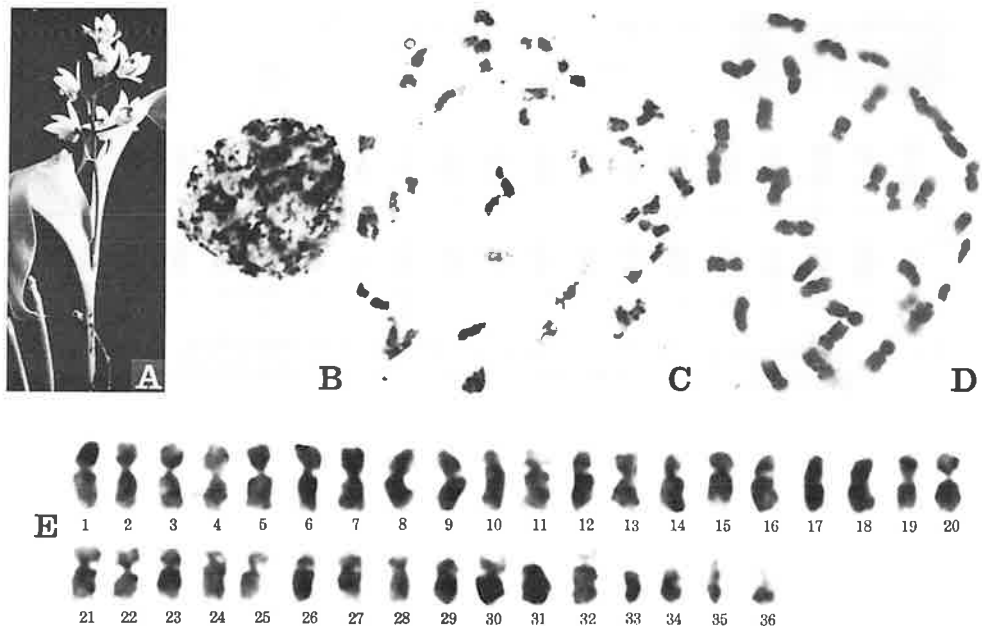

Fig. 7. Photomicrographs of the somatic chromosomes of *Eria coronaria*.
A, flowers. B, chromosomes at resting stage. C, chromosomes at mitotic prophase. D, chromosomes at mitotic metaphase, 2n=36.
A, × 0.2. B–D, × 1500. E × 3000.

The chromosomes in the resting nucleus were similar to those of *Eria corneri* described above (p. 4). That is, some of the chromomeric granules formed large chromocentral blocks which varied in number from 15 to 20 showing irregular margin. The chromocentral blocks were approximately 2.0 μm in diameter. At prophase the chromosomes formed early condensed segments located in the proximal and interstitial regions. In some chromosomes early condensed segments were additionally found in the distal regions. The early condensed segments situated between the condensed segments were observed transforming gradually to the late condensed segments. Thus, chromosome morphology at resting stage was considered to belong to the category of the complex chromocenter type according to Tanaka's classification (1971).

The chromosomes at mitotic metaphase were found to be similar to those of *Eria corneri* and showed the gradual variation of length ranging from 3.0 μm to 1.4 μm. The positions of centromeres of the chromosomes were median, submedian or subterminal. Among the 36 chromosomes about 24 were median, ten (Nos. 15, 16, 25–30, 35, 36) were submedian and two (Nos. 12 and 24) were subterminal.

The metaphase chromosomes were categorized to be homogenous and a gradual karyotype according to chromosome length and the category of the asymmetric karyotype according to arm ratio.

8. *Eria biflora* Griff., 2n=46, Table 9 and Fig. 8. Validated specimen No. 3098.

A clone was obtained from Thailand. External morphological characteristics of the clone were as follows: Stem was about 15 cm in length and flattened at the apex which bore 3 to 5 leaves. Flowers were pale yellow and bloomed in pairs. Thus, this description is same as that of Seidenfaden and Smitinand (1960).

The chromosome number of the clone was examined to be 2n=46, a new report to this species.

The chromosomes at resting stage were conspicuous in this report. Large spherical chromocentral blocks which varied in number from 20 to 25 per nucleus were observed in resting nuclei. Especially six large chromocentral blocks were obvious. They ranged from 1.5 μm to 2.0 μm in diameter. At prophase the heterochromatic segments were located almost in the whole region of the six longest chromosomes. The heterochromatic segments of another chromosomes were located in proximal regions and transformed gradually to euchromatic segments located distally. Thus, the morphology of chromosomes at resting stage was considered to be intermediate between the complex chromocenter type and the prochromosome type according to Tanaka's classification (1971).

The chromosomes at mitotic metaphase showed gradual variations of length ranging from 2.9 μm to 1.1 μm, and the positions of centromeres were mostly median, except for four (Nos. 1, 3, 5, 14) submedian chromosomes.

This species was found to have distinct chromosome number and showed partially heterogenous and a bimodal type according to chromosome length and a symmetric karyotype according to arm ratio.

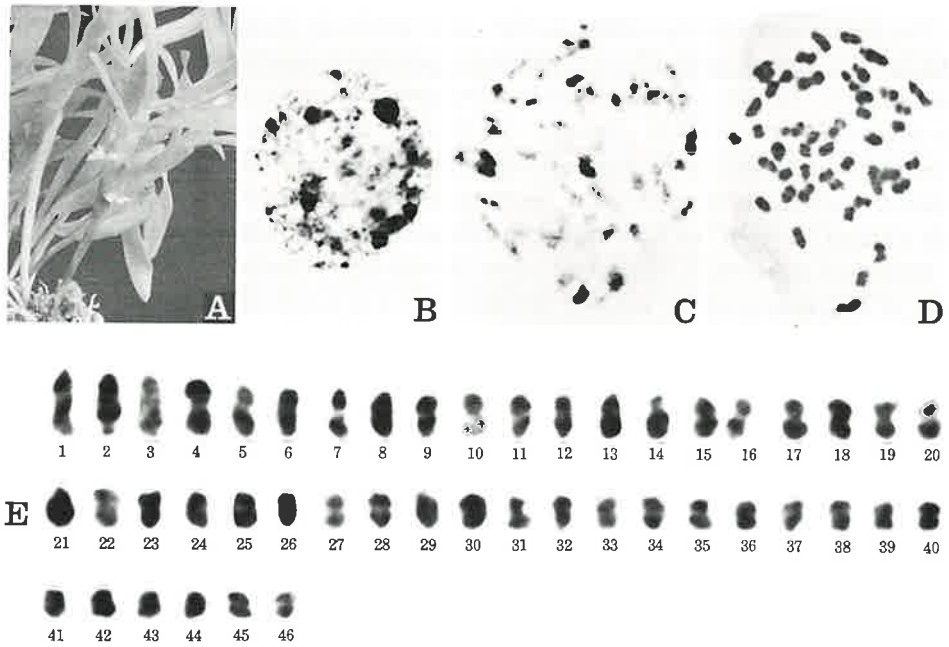

Fig. 8. Photomicrographs of the somatic chromosomes of *Eria biflora*.
A, flowers. B, chromosomes at resting stage. C, chromosomes at mitotic prophase. D, chromosomes at mitotic metaphase, 2n=46.
A, × 0.2. B–D, × 1500. E, × 3000.

9. *Eria floribunda* Ldl., 2n=38, Table 10 and Fig. 9. Validated specimen No. 3096.

A clone was obtained from Thailand. External morphological characteristics of the clone were as follows: Stem was clavate and had four to six leaves near the apex. Leaves were thin and elliptical. Inflorescence spread horizontally from the upper half of the stem and bore often at the same time. Flowers were densely crowded and white in color, faintly tinged with pink. Thus, this description is same as that of Seidenfaden and Smitinand (1960).

The chromosome number of the clone was examined to be 2n=38, which was different from the number of 2n=44 previously reported by Pancho (1965).

The chromosomes at resting stage formed several spherical chromocentral blocks which varied in number from 6 to 10 per nucleus. The chromocentral blocks were approximately 0.8 μm in diameter. Some of the chromatin formed chromomeric small granules and the others formed chromomeric fibrous threads scattered in the whole region of nucleus. At prophase heterochromatic segments were located almost in the whole region of several chromosomes. The heterochromatic segments of another chromosome which was located in the proximal region was transformed gradually into euchromatic segments located distally. Chromosome morphology at resting stage was found to be similar to that of *Eria rufinula* described above (p. 3). That is, the karyotypes of the chromosomes were an intermediate category between the complex chromocenter type and the simple chromocenter type proposed by Tanaka (1971).

The chromosomes at mitotic metaphase showed the gradual variations of length ranging from 1.5 μm to 0.7 μm, and the positions of centromeres were all median, except for two (Nos. 13, 14) submedian chromosomes. Among the 38 chromosomes two longest chromosomes were distinct. They were both 1.5 μm in length. Arm ratios of these chromosomes were both 1.1, and the positions of centromeres were median.

This species was found the show heterogenous and bimodal type in length and more symmetric karyotype in arm ratio.

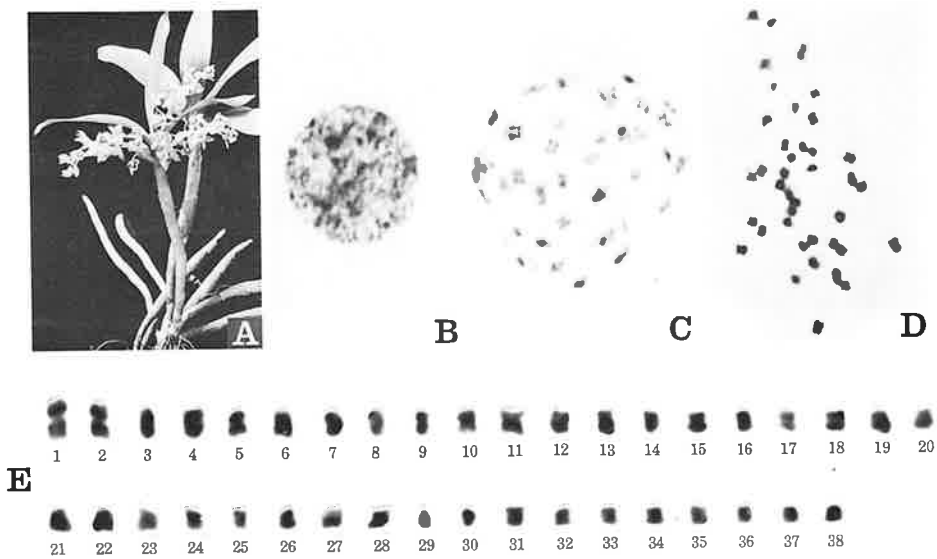

Fig. 9. Photomicrographs of the somatic chromosomes of *Eria floribunda*.
A, flowers. B, chromosomes at resting stage. C, chromosomes at mitotic prophase. D, chromosomes at mitotic metaphase, 2n=38.
A, x 0.2. B–D, x 1500. E, x 3000.

10. *Eria pachystachya* Ldl., 2n=38, Table 11 and Fig. 10. Validated specimen No. 3106.

A clone was obtained from Malaysia. External morphological characteristics of the clone were as follows: Stems was cylindirical and about 30 cm long. Leaves were thin and elliptical. Inflorescence obliquely ascending was about 12 cm long. Flowers were crowded and white in color with faint pink suffusion on the lip. Thus, this description is same as that of Holttum (1953).

The chromosome number of the clone was examined to be 2n=38, a new report to this species.

The chromosomes in the resting nuclei were observed as chromomeric granules and fibrous threads scattered in the whole region of nucleus. Several spherical chromocentral blocks which were approximately 0.8 μm in diameter varied in number from 6 to 10 per nucleus. Some of the chromatin formed chromomeric, small granules and the others formed chromomeric fibrous threads scattered in the whole region of nucleus. At prophase the heterochromatic segments

were located almost on the whole regions of several chromosomes. The heterochromatic segments of another chromosome which was located in the proximal region was transformed gradually into euchromatic segments located distally. The morphology of chromosomes at the resting stage was found to be similar to that of *Eria rufinula* described above (p. 3). That is, the karyotype of the chromosomes were an intermediate category between the complex chromocenter type and the simple chromocenter type proposed by Tanaka (1971).

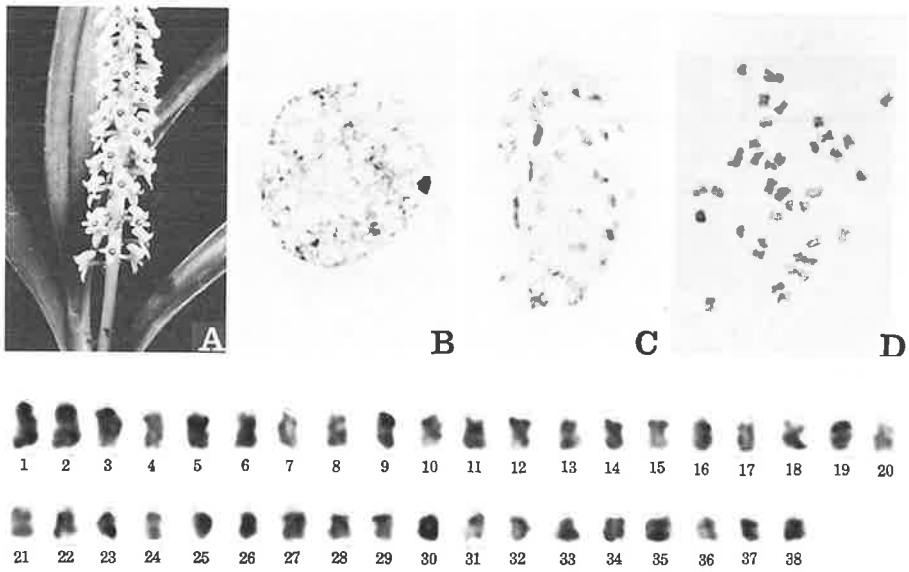

Fig. 10. Photomicrographs of the somatic chromosomes of *Eria pachystachya*.
A, flowers. B, chromosomes at resting stage. C, chromosomes at mitotic prophase. D, chromosomes at mitotic metaphase, 2n=38.
A, × 0.9. B–D, × 1500. E, × 3000.

The chromosomes at mitotic metaphase showed the gradual variations of length ranging from 1.8 μm to 0.9 μm, and the positions of centromeres were all median, except for four (Nos. 17–20) submedian chromosomes. Among the 38 chromosomes two longest chromosomes were distinct. They were both 1.8 μm in length. Arm ratios of both these chromosomes were 1.3, and thus the positions of centromeres were median.

This species was found to show heterogenous and a bimodal karyotype according to chromosome length and more symmetric karyotype according to arm ratio.

11. *Eria acervata* Ldl., 2n=38, Table 12 and Fig. 11. Validated specimen No. 3118.

A clone was obtained from Thailand. External morphological characteristics of the clone were as follows: Pseudobulbs were compressed and about 10 cm in length. Leaves were thin and lanceolate. Inflorescence arose from near the apex of new pseudobulb and bore loose flowers. Thus, this description is same as that of Seidenfaden and Smitinand (1960).

The chromosome number of the clone was examined to be 2n=38, which was different

from the number of n=20 in PMC's reported by Mehra & Sehgal (1975).

The chromosomes at resting stage formed many chromomeric granules and fibrous threads scattered in the whole region of nucleus. Many spherical chromocentral blocks which varied in number from 20 to 30 per nucleus were observed in the resting nuclei. The chromocentral blocks were approximately 0.8 μm in diameter. The chromosomes at mitotic prophase had early condensed large segments in the proximal regions, late condensed segments in the distal regions, and gradually condensed segments in the interstitial regions. Chromosomes morphology at resting stage was found to be similar to that of *Eria rufinula* described in the previous paragraph (No. 1). That is, the karyotypes of the chromosomes were an intermediate category between the complex chromocenter type and the simple chromocenter type proposed by Tanaka (1971).

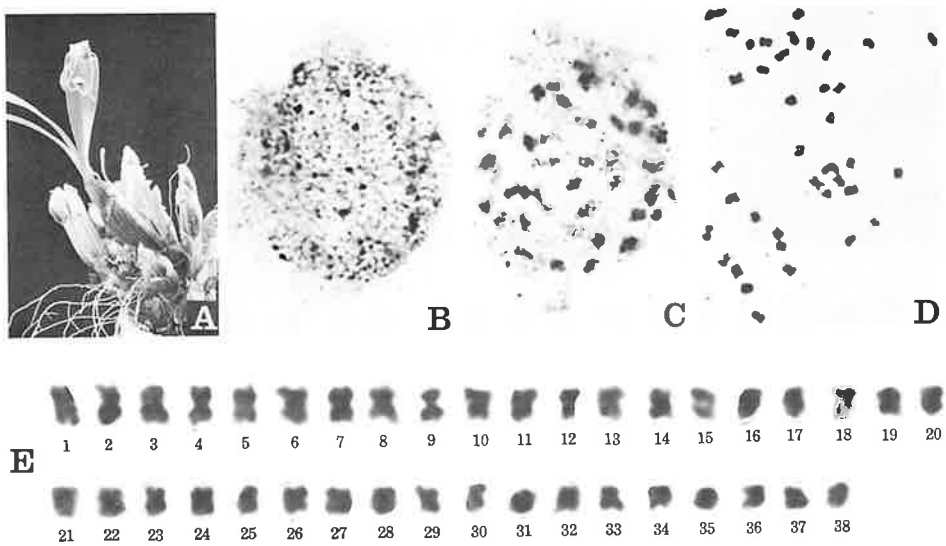

Fig. 11. Photomicrographs of the somatic chromosomes of *Eria acervata*.
A, seedling. B, chromosomes at resting stage. C, chromosomes at mitotic prophase. D, chromosomes at mitotic metaphase, 2n=38.
A, x 0.2. B–D, x 1500. E, x 3000.

The chromosomes at mitotic metaphase were found to be similar to those of *Eria rufinula*. The 38 chromosomes varied in length gradually and ranged from 1.7 μm to 0.9 μm, and the positions of centromeres were all median, except for six (Nos. 27–32) submedian chromosomes. Among 38 chromosomes four longest chromosomes were distinct. They were 1.7 μm in length. Arm ratios of both these chromosomes were 1.5 and 1.1 and the positions of centromeres were median.

The metaphase chromosomes of this species were categorized to be the homogenous and a gradual karyotype according to chromosome length and the category of the symmetric karyotype according to arm ratio.

12. *Eria bractescens* Ldl., 2n=38, Table 13 and Fig. 12. Validated specimen No. 3112.

A clone was obtained from Thailand. External morphological characteristics of the clone were as follows: Pseudobulb was thick and freshy. Leaves were lanceolate and about 15 cm in length. Inflorescence was erect and about 15 cm in length. Flowers were white in color. Thus, this description is same as that of Seidenfaden and Smitinand (1960).

The chromosome number of the clone was examined to be 2n=38, which was different from the number of 2n=40 previously reported by Sharma & Chatterji (1966).

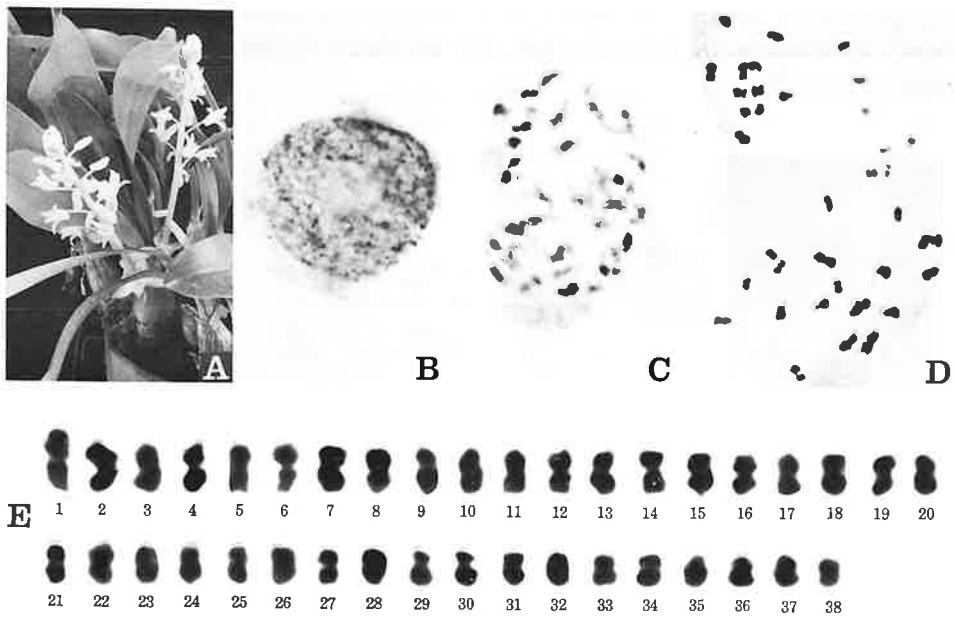

Fig. 12. Photomicrographs of the somatic chromosomes of *Eria bractescens*.
A, flowers. B, chromosomes at resting stage. C, chromosomes at mitotic prophase. D, chromosomes at mitotic metaphase, 2n=38.
A, × 0.2. B–D, × 1500. E, × 3000.

The chromosomes at resting stage were observed as chromomeric granules and fibrous threads scattered in the whole region of nucleus. Several spherical chromocentral blocks which varied in number from 6 to 10 per nucleus were observed in the resting nuclei. The chromocentral blocks were approximately 0.8 μm in diameter. The chromosomes at mitotic prophase had early condensed large segments in the proximal regions, late condensed segments in the distal regions, and gradually condensed segments in the interstitial regions. Chromosome morphology at resting stage was found to be similar to that of *Eria rufinula* described above (p. 3). That is, the karyotype of the chromosomes were an intermediate category between the complex chromocenter type and the simple chromocenter type at resting stage according to Tanaka's classification (1971).

The chromosomes at mitotic metaphase were found to be similar to those of *Eria rufinula*.

The 38 chromosomes varied in length gradually and ranged from 2.7 μm to 1.2 μm, and the positions of centromeres were all median.

The metaphase chromosomes of this species were categorized to be heterogenous and a bimodal karyotype according to chromosome length and the category of the most symmetric karyotype according to arm ratio.

13. *Eria graminifolia* Ldl., 2n=42, Table 14 and Fig. 13. Validated specimen No. 3105.

A clone was obtained from India. External morphological characteristics of the clone were as follows: Pseudobulbs were tufted and had two to four leaves near the apex. Leaves were lanceolate and about 15 cm in length. This clone has not yet bloomed in our garden. Thus, this description is same as that of Pradhan (1979).

The chromosome number of the clone was examined to be 2n=42, which was differed from the number of n=19 in PMC's previously reported by Mehra and Vij (1970).

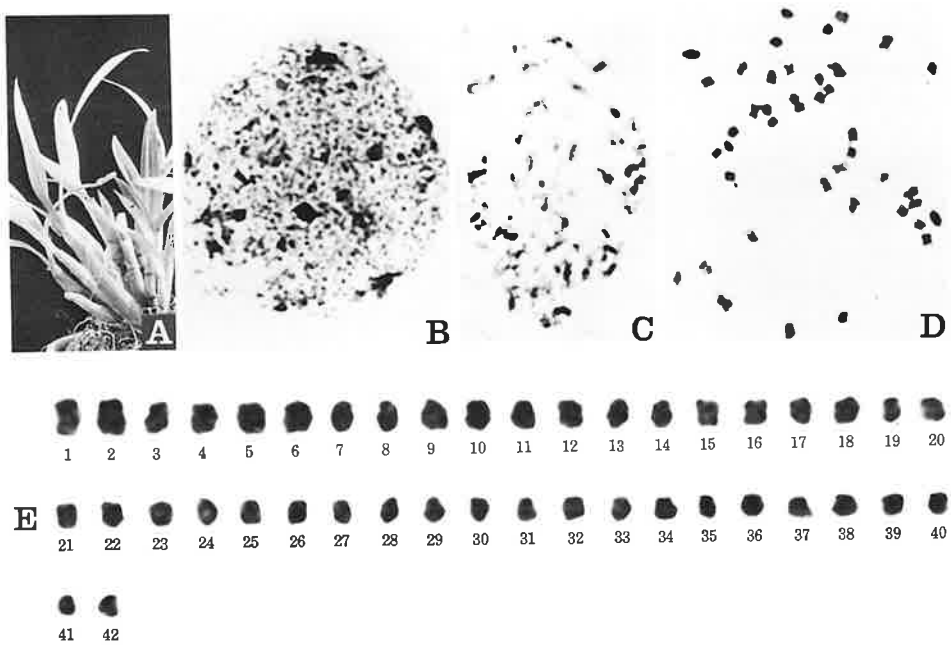

Fig. 13. Photomicrographs of the somatic chromosomes of *Eria graminifolia*.
A, seedling. B, chromosomes at resting stage. C, chromosomes at mitotic prophase. D, chromosomes at mitotic metaphase, 2n=42.
A, × 0.2. B–D, × 1500. E, × 3000.

The chromosomes at resting stage were observed as chromomeric granules and fibrous threads scattered in the whole region of nucleus. Several spherical chromocentral blocks which varied in number from 6 to 10 per nucleus were observed in the nuclei. The chromocentral blocks were approximately 0.8 μm in diameter. At prophase the heterochromatic segments which were located in the proximal regions, transformed gradually to euchromatic segments

located distally. Thus, the karyotype of the resting chromosomes was considered to belong to an intermediate category between the complex chromocenter type and the simple chromocenter type proposed by Tanaka (1971).

The chromosomes at mitotic metaphase showed the gradual variation of length ranging from 1.6 μm to 0.8 μm, and the positions of centromeres were either median or submedian. Among the 42 chromosomes about 24 were median and 18 (Nos. 3–9, 13, 14, 19, 29–42) were submedian. Two longest chromosomes were distinct. They were about 1.6 μm in length and the positions of their centromeres were median.

This species was found to show heterogenous and a bimodal karyotype according to chromosome length and an asymmetric karyotype according to arm ratio.

14. *Eria hyacinosoides* (Bl.) Ldl., 2n=38 Table 15 and Fig. 14. Validated specimen No. 3099, 3110.

Two clones were obtained from Malaysia. External morphological characteristics of the clones were as follows: Pseudobulbs were thick and freshy, covered with loose sheaths. Leaves were lanceolate and about 20 cm in length. Inflorescences were erect and about 15 cm long. Flowers were white in color. Thus, this description is same as that of Holttum (1953).

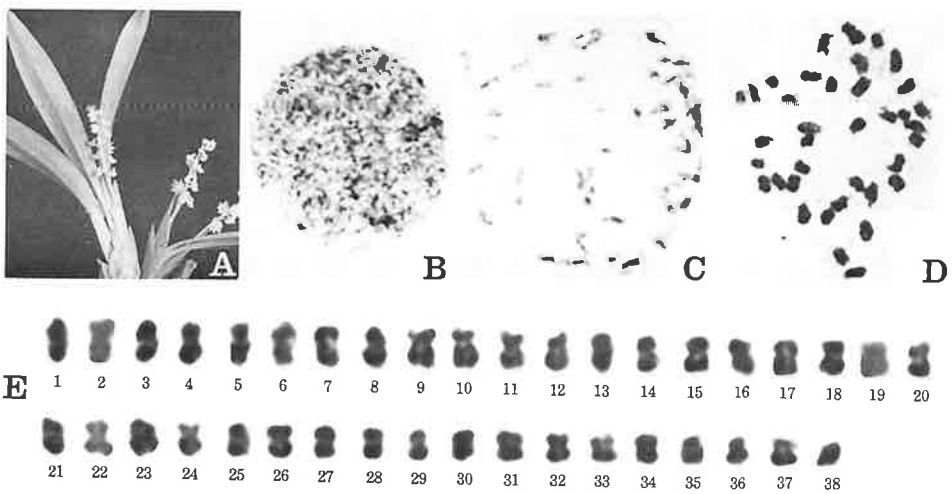

Fig. 14. Photomicrographs of the somatic chromosomes of *Eria hyacinsoides*.
A, flowers. B, chromosomes at resting stage. C, chromosomes at mitotic prophase. D, chromosomes at mitotic metaphase, 2n=38.
A, x 0.1. B–D, x 1500. E, x 3000.

The chromosome number of the two clones was examined to be 2n=38, a new report to this species.

The chromosomes at resting stage were observed as chromomeric granules and fibrous threads scattered in the whole region of nucleus. Several spherical chromocentral blocks which varied in number from 20 to 30 per nucleus were observed in the resting nuclei. The chromo-

central blocks were approximately 0.8 μm in diameter. Chromosomes at mitotic prophase formed early condensed segments located in proximal regions and transformed gradually to euchromatic segments located distally. Chromosome morphology at resting stage was found to be similar to that of *Eria rufinula* described above (p. 3). That is, the karyotypes of chromosomes were considered to belong to an intermediate category between the complex chromocenter type and the simple chromocenter type proposed by Tanaka (1971).

The chromosomes at mitotic metaphase were found to be similar to those of *Eria rufinula*. The 38 chromosomes varied in length gradually and ranged from 1.8 μm to 1.0 μm, and the positions of centromeres were all median, except for two (Nos. 9, 10) submedian chromosomes.

The metaphase chromosomes of this species were categorized to be the homogenous and a gradual karyotype according to chromosome length and the category of the symmetric karyotype according to arm ratio.

15. *Eria ovata* Ldl., 2n=38, Table 16 and Fig. 15. Validated specimen No. 3079, 3081, 3095.

Three clones were collected from Iriomote Island in Japan. External morphological char-

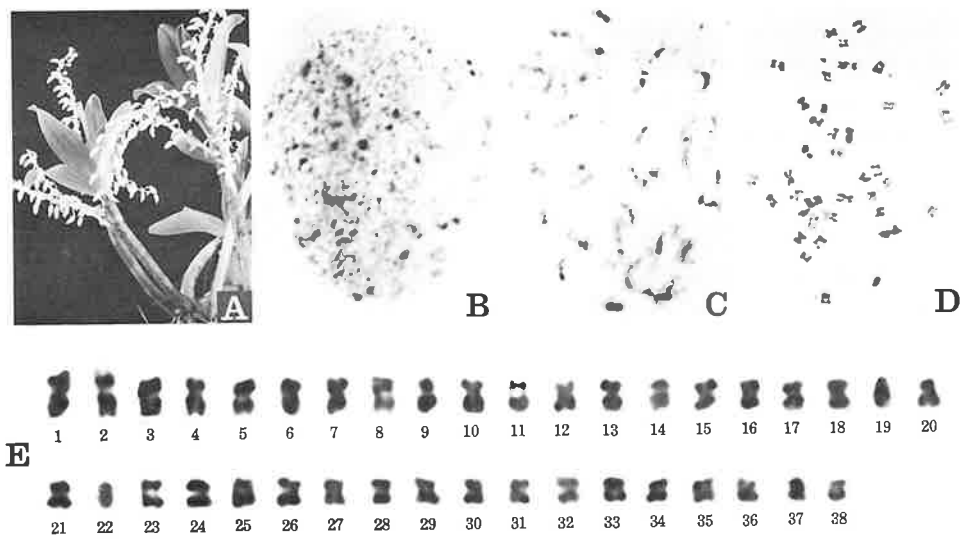

Fig. 15. Photomicrographs of the somatic chromosomes of *Eria ovata*.
A, flowers. B, chromosomes at resting stage. C, chromosomes at mitotic prophase. D, chromosomes at mitotic metaphase, 2n=38.
A, x 0.1. B–D, x 1500. E, x 3000.

acteristics of the clones were as follows: Stem was cylindrical, erect and usually 20 cm in length. Leaves were thick and narrowly elliptic. Inflorescences were lateral and about 15 cm in length. Flowers were yellowish white in color. Thus, this description is same as that of Liu and Su (1978).

The chromosome number of the three clones was examined to be all 2n=38, which was different from the number of 2n=44 previously reported by Pancho (1965), 2n=36 by Tanaka (1965) and n=18 in PMC's in *E. luchuensis* Yatabe; a synonym of this species by Terasaka and Tanaka (1974).

The chromosomes at resting stage were observed as chromomeric granules and fibrous threads scattered in the whole region of nucleus. Many spherical chromocentral blocks which varied in number from 20 to 30 per nucleus were observed in the resting nucleus. The chromocentral blocks were approximately 0.8 μm in diameter. At prophase the heterochromatic segments were located in the proximal regions and transformed gradually to euchromatic segments located distally. Chromosome morphology at resting stage was found to be similar to that of *Eria rufinula* described above (p. 3). That is, the karyotypes of chromosomes were an intermediate category between the complex chromocenter type and the simple chromocenter type proposed by Tanaka (1971).

The chromosomes at mitotic metaphase were found to be similar to those of *Eria bractescens*. The 38 chromosomes varied in length gradually and ranged from 2.0 μm to 0.9 μm, and the positions of centromeres were all median, except for two (Nos. 13, 14) submedian chromosomes. Among the 38 chromosomes two longest chromosomes were distinct. They were both 2.0 μm in length. Arm ratios of these two chromosomes were 1.5, and thus the positions of centromeres were median.

The metaphase chromosomes of this species were categorized to be heterogenous and a bimodal karyotype according to chromosome length and the category of the symmetric karyotype according to arm ratio.

16. *Eria reptans* (Fr. et Sav.) Makino, 2n=38, Table 17 and Fig. 16. Validated specimen No. 1273, 1274, 3078, 3088, 3089.

Five clones were collected from three localities shown in Table 1. External morphological characteristics of this species were as follows: Pseudobulb was ellipsoid and about 2.5 cm in length. Leaves were narrowly elliptic and about 5.5 cm in length. Inflorescence which bore one to four flowers was terminal and arose between the two leaves of the apex of stem. Flowers were white in color. Thus, this description is same as that of Ohwi (1978).

The chromosome numbers of the five clones were examined to be 2n=38 which confirmed the previous report (Tanaka 1965), and which did not confirmed the number of 2n=40 by Mutsuura & Nakahira (1958).

The chromosomes at resting stage were observed as chromomeric granules and fibrous threads scattered in the whole region of nucleus. Several spherical chromocentral blocks which varied in number from 6 to 10 per nucleus were observed in the resting nuclei. The chromocentral blocks were approximately 0.8 μm in diameter. The chromosomes at mitotic prophase formed early condensed segments located in proximal regions and transformed gradually to euchromatic segments located distally. Chromosome morphology at resting stage was found to be similar to that of *Eria rufinula* described above (p. 3). That is, the karyotype of chromosomes were an intermediate category between the complex chromocenter type and the simple chromocenter type proposed by Tanaka (1971).

The chromosomes at mitotic metaphase were found to be similar to those of *Eria bractescens*. The 38 chromosomes varied in length gradually and ranged from about 2.1 μm to 1.0 μm, and the positions of centromeres were all median, except for two (Nos. 17, 18) submedian

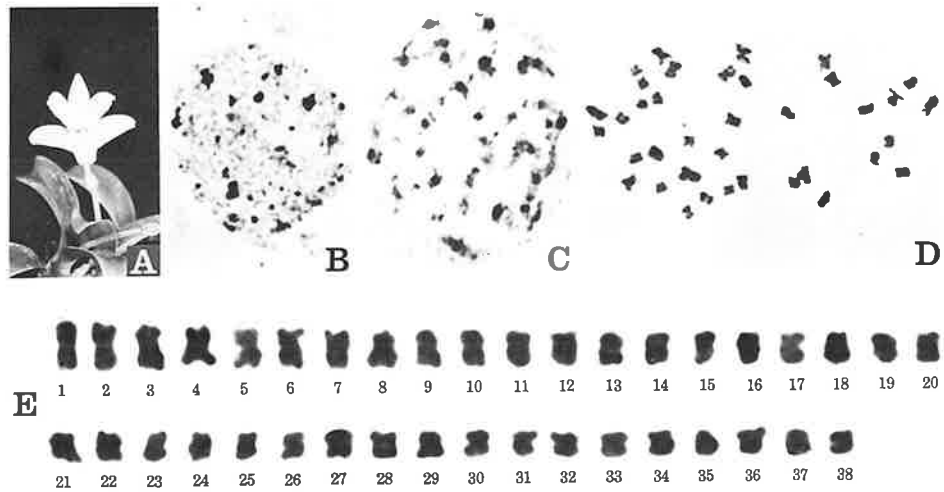

Fig. 16. Photomicrographs of the somatic chromosomes of *Eria reptans*.
A, flower. B, chromosomes at resting stage. C, chromosomes at mitotic prophase. D, chromosomes at mitotic metaphase, 2n=38.
A, x 0.8. B–D, x 1500. E, x 3000.

chromosomes.

The metaphase chromosomes of this species were categorized to be homogenous and a gradual karyotype according to chromosome length and the category of the symmetric karyotype according to arm ratio.

17. *Eria spicata* (D. Don) Hand.-Mazz., 2n=38, Table 18 and Fig. 17. Validated specimen No. 3119.

A clone was obtained from Thailand. External morphological characteristics of the clone were as follows: Pseudobulbs were stout and about 10 cm in length. Leaves were lanceolate and about 15 cm long. Inflorescence was spicate and densely flowered. Flowers were white in color. This species is still cultivated as *Eria convallarioides* Ldl.. Thus, this description is same as that of Seidenfaden and Smitinand (1960).

The chromosome number of the clone was examined to be 2n=38 which confirmed the previous report of n=19 in PMC's by Chardard (1963) and which did not confirmed the number of n=20 reported by Mehra & Vij (1970).

The chromosomes at resting stage were observed as chromomeric granules and fibrous threads scattered in the whole region of nucleus like other species described in this report. Besides some spherical chromocentral blocks two large blocks which were approximately 2.0 μm in diameter were also observed in the nuclei. At prophase the heterochromatic segments were

located almost in whole regions of two large chromosomes. The heterochromatic segments of other chromosome were located in the proximal regions and transformed gradually to euchromatic segments located distally. Thus, chromosome morphology at resting stage was considered to be an intermediate category between the complex chromocenter type and the simple chromocenter type proposed by Tanaka (1971).

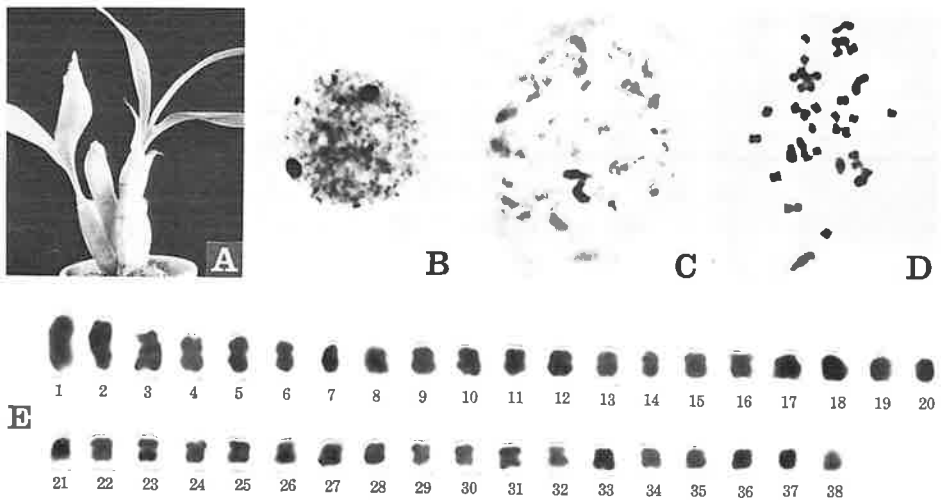

Fig. 17. Photomicrographs of the somatic chromosomes of *Eria spicata*.
A, seedling. B, chromosomes at resting stage. C, chromosomes at mitotic prophase. D, chromosomes at mitotic metaphase, 2n=38.
A, × 0.2. B–D, × 1500. E, × 3000.

The metaphase chromosomes were categorized to be heterogenous and a bimodal karyotype according to chromosome length and the category of the symmetric karyotype according to arm ratio.

Chromosomes at mitotic metaphase showed the gradual variation of length ranging from approximately 2.2 μm to 0.9 μm, and the positions of centromeres were median and submedian. Of the 38 chromosomes about 23 chromosomes were median and five (Nos. 3, 15 – 17, 18) were submedian. Two longest chromosomes were distinct. They were 2.2 μm in length and had the centromeres in median regions.

18. *Eria tomentosiflora* Hayata, 2n=38, Table 19 and Fig. 18. Validated specimen No. 3114, 3116.

Two clones were obtained from Formosa. External morphological characteristics of the clones were as follows: Stem was pendulous and new branches were developing from the middle nodes of old ones. Leaves were narrow and about 15 cm in length. Inflorescences were lateral and arose from under the leaves. Flowers were greenish yellow in color, tinged with redbrown. Thus, this description is same as that of Liu and Su (1978).

The chromosome number of the two clones was examined to be 2n=38, which was dif-

ferent from the number of 2n=44 in *Eria philippinensis* Ames, a synonym of this species, reported by Pancho (1965).

The chromosomes at resting stage were observed as chromomeric granules and fibrous

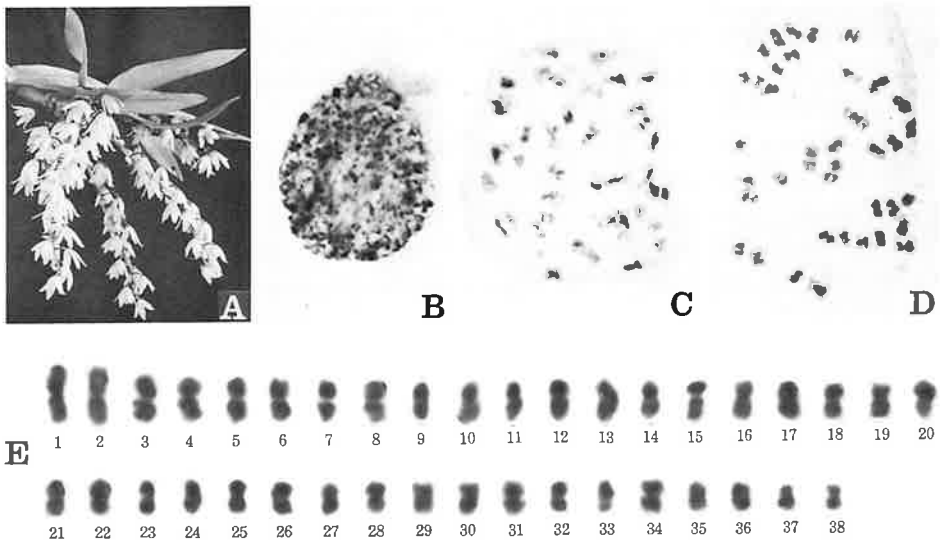

Fig. 18. Photomicrographs of the somatic chromosomes of *Eria tomentosiflora*.
A, flowers. B, chromosomes at resting stage. C, chromosomes at mitotic prophase. D, chromosomes at mitotic metaphase, 2n=38.
A, x 0.2. B–D, x 1500. E, x 3000.

threads scattered in the whole region of nucleus. Many spherical blocks which varied in number from 30 to 40 per nucleus were observed in the resting nuclei. The chromocentral blocks were approximately 0.8 μm in diameter. At prophase the heterochromatic segments were located in the proximal regions and transformed gradually to euchromatic segments located distally. Thus, the karyotype features were found to those of *Eria rufinula* described above (p. 3) with the exception of the shape of mitotic metaphase chromosomes. That is, chromosomes at metaphase showed the gradual variation of length ranging from approximately 2.5 μm to 1.1 μm, and the positions of the centromeres were median and submedian. Among the 38 chromosomes about 36 were median and two (Nos. 37, 38) were submedian.

The metaphase chromosomes were categorized to be heterogenous and a bimodal karyotype according to chromosome length and the category of the symmetric karyotype according to arm ratio.

Results and Discussion

In the present observations, chromosomes in the resting nuclei of 18 species of *Eria* were found to be highly variable amongst the species. There were four clear different karyotypes

classified in their resting nuclei proposed by Tanaka (1971): the simple chromocenter type, the complex chromocenter type, intermediate between one of those, and the prochromosome type. Among the 18 species only one species, *E. stricta* 2n=40, was observed to have the resting chromosomes of the simple chromocenter type. Three species, *E. corneri* 2n=36, *E. javanica* 2n=36 and *E. coronaria* 2n=36, were observed to have the resting chromosomes of the complex chromocenter type. The other 13 species showed resting chromosomes intermediate between the simple and the complex chromocenter type, with the exception for *E. biflora* 2n=46 of the prochromosome type.

The chromosome numbers of the species of *Eria* have been previously reported to be 2n= 36, 38, 40, 44 and 66 (Mutsuura & Nakahira 1958, Chardard 1963, Tanaka 1965, Pancho 1965, Sharma & Chatterji 1966, Mehra & Vij 1970, Terasaka & Tanaka 1974 and Mehra & Sehgal 1974). Thus, the chromosome numbers of 2n=42 and 2n=46 in the genus were counted here for the first time. In this study, the 2n=36 was observed in three species; *E. corneri, E. javanica* and *E. coronaria,* the 2n=38 in 12 species; *E. rufinula, E. ornata, E. pannea, E. floribunda, E. pachystachya, E. acervata, E. bractescens, E. hyacinsoides, E. ovata, E. reptans, E. spicata* and *E. tomentosiflora*; the 2n=40 in one species; *E. stricta*, the 2n=42 in one species; *E. graminifolia,* and the 2n=46 in one species; *E. biflora.* However, the 2n=44 and 2n=66 previously reported were not observed in the present materials.

Three species with the chromosome number 2n=36 had conspicuously long chromosomes, average lengths 3.2 μm, 2.5 μm and 2.3 μm, respectively, while *E. floribunda* 2n=38 had short sized chromosomes with the average length as 0.9 μm.

According to size variation in the member of the chromosome sets, there were three different types: gradient, bimodal and trimodal karyotypes. Seven species, *E. rufinula* 2n=38, *E. ornata* 2n=38, *E. stricta* 2n=40, *E. coronaria* 2n=36, *E. acervata* 2n=38, *E. hyacinsoides* 2n=38 and *E. reptans* 2n=38, were found to have gradient type, nine species, *E. pannea* 2n=38, *E. biflora* 2n=46, *E. floribunda* 2n=38, *E. pachystachya* 2n=38 and *E. bractescens* 2n=38, *E. graminifolia* 2n=42, *E. ovata* 2n=38, *E. spicata* 2n=38 and *E. tomentosiflora* 2n=38, bimodal type, and the other two species, *E. corneri* 2n=36 and *E. javanica* 2n=36, trimodal type.

According to symmetry degree depended on arm ratio, there were two types: symmetric and asymmetric types. The symmetric karyotype was observed in the species with the chromosome numbers of 2n=36, *E. corneri, E. javanica,* 2n=38, *E. ornata, E. pannea, E. floribunda, E. pachystachya, E. acervata, E. bractescens, E. hyacinsoides, E. ovata, E. reptans, E. spicata* and *E. tomentosiflora,* 2n=40, *E. stricta,* and 2n=46, *E. biflora,* while the asymmetric karyotype was observed in the species with the chromosome numbers of 2n=36, *E. coronaria,* 2n=38, *E. rufinula,* and 2n=42, *E. graminifolia.*

Thus, the present karyomorphological study classified and categorized the 18 species into nine groups:

Type A: *E. javanica, E. corneri*

Key characters; 2n=36, longer chromosomes, complex chromocenter type, heterogenous and trimodal karyotype according to chromosome length, symmetric karyotype according to arm ratio.

Type B: *E. coronaria*

Key characters; 2n=36, longer chromosomes, complex chromocenter type, homogenous and gradient karyotype according to chromosome length, asymmetric karyotype according to arm ratio.

Type C: *E. ornata*
Key characters; 2n=38, medium size chromosomes, intermediate chromocenter type, homogenous and gradient karyotype according to chromosome length, symmetric karyotype according to arm ratio.

Type D: *E. rufinula*
Key characters; 2n=38, medium size chromosomes, intermediate chromocenter type, homogenous and gradient karyotype according to chromosome length, asymmetric karyotype according to arm ratio.

Type E: *E. acervata, E. hyacinsoides, E. reptans*
Key characters; 2n=38, shorter chromosomes, intermediate chromocenter type, homogenous and gradient karyotype according to chromosome length, symmetric karyotype according to arm ratio.

Type F: *E. pannea, E. floribunda, E. pachystachya, E. bractescens, E. ovata, E. spicata, E. tomentosiflora*
Key characters; 2n=38, shorter chromosomes, intermediate chromocenter type, heterogenous and bimodal karyotype according to chromosome length, symmetric karyotype according to arm ratio.

Type G: *E. stricta*
Key characters; 2n=40, shorter chromosomes, simple chromocenter type, homogenous and gradient karyotype according to chromosome length, symmetric karyotype according to arm ratio.

Type H: *E. graminifolia*
Key characters; 2n=42, shorter chromosomes, intermediate chromocenter type, heterogenous and bimodal karyotype according to chromosome length, asymmetric karyotype according to arm ratio.

Type I: *E. biflora*
Key characters; 2n=46, shorter chromosomes, prochromosome type, heterogenous and bimodal karyotype according to chromosome length, symmetric karyotype according to arm ratio.

The basic classification of Thailand species of the genus *Eria* was established by Seidenfaden and Smitinand (1960): the 44 species were divided into 13 sections mainly by the morphology of pseudobulbs, inflorescences and floral structures. Eleven species belonged to eight sections were here studied: the karyotypes of nine species belonged to six sections justified Seidenfaden and Smitinand's classification (1960), but those of *E. pannea* and *E. floribunda* which belonged to sect. Strongyleria and sect. Urostachya were not karyomorphologically distinguished from the species of sect. Hymneria.

Among seven species which were not treated by Seidenfaden and Smitinand (1960), three from Japan, one from Formosa, two from Malaysia and one from India, could be grouped

into three sections, Goniorhabdos, Urostachya and Hymneria, of Seidenfaden and Smitinand's system (1960) (Table 1). Indeed, the results of the present karyotype analysis of six species, *E. corneri, E. pachystachya, E. hyacinsoides, E. ovata, E. reptans E. tomentosiflora,* supported Seidenfaden and Smitinand's system except for *E. graminifolia,* while those of *E. graminifolia* of sect. *Hymneria* taxonomically treated by Pradhan (1979) did not support the system since the chromosome number of this species was 2n=42, different from 2n=38 of the other species of this section.

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Summary

1. Karyomorphological observations were carried out in 18 species of *Eria*.
2. The chromosome numbers of seven out of the 18 species studied, *E. rufinula* 2n=38, *E. javanica* 2n=36, *E. ornata* 2n=38, *E. stricta* 2n=40, *E. biflora* 2n=46, *E. pachystachya* 2n=38 and *E. hyacinsoides* 2n=38, were newly reported.
3. The chromosome numbers of seven species, *E. pannea* 2n=38, *E. floribunda* 2n=38, *E. acervata* 2n=38, *E. bractescens* 2n=38, *E. graminifolia* 2n=42, *E. ovata* 2n=38 and *E. tomentosiflora* 2n=38, differed from those which have been reported previously.
4. The chromosome numbers of 2n=42 and 2n=46 were reported as new to the genus *Eria.*
5. *E. corneri, E. javanica and E. coronaria* were found to have longer chromosomes than those of the other 15 species.
6. On the variation of chromosome length in a chromosome set, three different types, gradient, bimodal and trimodal, were observed.
7. On the degree of symmetry according to arm ratio of chromosome, the karyotypes of *E. corneri, E. javanica, E. coronaria, E. ornata, E. rufinula* and *E. graminifolia* were categorized to be of asymmetric types.
8. The eighteen species investigated were classified by chromosome morphology at resting stage into four groups: one species, *E. stricta* 2n=40, with the simple chromocenter type, three species, *E. corneri* 2n=36, *E. javanica* 2n=36 and *E. coronaria* 2n=36, with the complex chromocenter types, 13 species, *E. rufinula* 2n=38, *E. ornata* 2n=38, *E. pannea* 2n=38, *E. floribunda* 2n=38, *E. pachystachya* 2n=38, *E. acervata* 2n=38, *E. bractescens* 2n=38, *E. graminifolia* 2n=42, *E. hyacinosoides* 2n=38, *E. ovata* 2n=38, *E. reptans* 2n=38, *E. spicata*

2n=38 and *E. tomentosiflora* 2n=38, with the intermediate type and one species, *E. biflora* 2n=46, with the prochromosome type.

9. On the basis of the results of the karyomorphological study, the 18 species of *Eria* investigated were categorized into nine types: type A; *E. corneri, E. javanica,* type B; *E. coronaria*, type C; *E. ornata,* type D; *E. rufinula,* type E; *E. acervata, E. hyacinsoides, E. reptans,* type F; *E. pannea, E. floribunda, E. pachystachya, E. bractescens, E. ovata, E. spicata, E. tomentosiflora,* type G; *E. stricta,* type H; *E. graminifolia,* type I; *E. biflora.*

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Table 2. Measurements of somatic chromosomes of *Eria rufinula*, 2n = 38 at metaphase

Chromosome	Length (μm)	Relative length	Arm ratio	Form
1	1.0 + 1.5 = 2.5	3.6	1.5	m
2	0.9 + 1.5 = 2.4	3.4	1.7	m
3	1.0 + 1.3 = 2.3	3.3	1.3	m
4	0.9 + 1.3 = 2.2	3.2	1.4	m
5	0.7 + 1.4 = 2.1	3.0	1.4	m
6	0.7 + 1.4 = 2.1	3.0	1.4	m
7	0.9 + 1.1 = 2.0	2.9	1.2	m
8	0.9 + 1.1 = 2.0	2.9	1.2	m
9	0.5 + 1.5 = 2.0	2.9	3.0	sm
10	0.5 + 1.5 = 2.0	2.9	3.0	sm
11	0.4 + 1.5 = 1.9	2.7	3.8	st
12	0.4 + 1.5 = 1.9	2.7	3.8	st
13	0.4 + 1.5 = 1.9	2.7	3.8	st
14	0.4 + 1.5 = 1.9	2.7	3.8	st
15	0.4 + 1.5 = 1.9	2.7	3.8	st
16	0.4 + 1.5 = 1.9	2.7	3.8	st
17	0.4 + 1.5 = 1.9	2.7	3.8	st
18	0.4 + 1.5 = 1.9	2.7	3.8	st
19	0.4 + 1.5 = 1.9	2.7	3.8	st
20	0.4 + 1.5 = 1.9	2.7	3.8	st
21	0.8 + 1.1 = 1.9	2.7	1.4	m
22	0.8 + 1.1 = 1.9	2.7	1.4	m
23	0.6 + 1.1 = 1.7	2.4	1.8	sm
24	0.6 + 1.1 = 1.7	2.4	1.8	sm
25	0.8 + 0.9 = 1.7	2.4	1.1	m
26	0.8 + 0.9 = 1.7	2.4	1.1	m
27	0.4 + 1.3 = 1.7	2.4	3.3	st
28	0.4 + 1.3 = 1.7	2.4	3.3	st
29	0.7 + 0.9 = 1.6	2.3	1.3	m
30	0.7 + 0.9 = 1.6	2.3	1.3	m
31	0.5 + 1.1 = 1.6	2.3	2.2	sm
32	0.6 + 1.0 = 1.6	2.3	1.7	m
33	0.4 + 1.1 = 1.5	2.2	2.8	sm
34	0.4 + 1.1 = 1.5	2.2	2.8	sm
35	0.4 + 1.1 = 1.5	2.2	2.8	sm
36	0.4 + 1.1 = 1.5	2.2	2.8	sm
37	0.5 + 0.9 = 1.4	2.0	1.8	sm
38	0.4 + 0.9 = 1.3	1.9	2.3	sm

Table 3. Measurements of somatic chromosomes of *Eria corneri*, 2n = 36 at metaphase

Chromosome	Length (μm)	Relative length	Arm ratio	Form
1	1.5 + 1.9 = 3.4	3.8	1.3	m
2	1.5 + 1.9 = 3.4	3.8	1.3	m
3	1.2 = 1.9 = 3.1	3.5	1.6	m
4	1.2 + 1.9 = 3.1	3.5	1.6	m
5	1.2 + 1.9 = 3.1	3.5	1.6	m
6	1.2 + 1.9 = 3.1	3.5	1.6	m
7	1.1 + 1.8 = 2.9	3.2	1.6	m
8	1.1 + 1.8 = 2.9	3.2	1.6	m
9	1.3 + 1.4 = 2.7	3.0	1.1	m
10	1.3 + 1.4 = 2.7	3.0	1.1	m
11	1.0 + 1.7 = 2.7	3.0	1.7	m
12	1.0 + 1.7 = 2.7	3.0	1.7	m
13	1.0 + 1.7 = 2.7	3.0	1.7	m
14	1.0 + 1.7 = 2.7	3.0	1.7	m
15	1.1 + 1.5 = 2.6	2.9	1.4	m
16	1.1 + 1.5 = 2.6	2.9	1.4	m
17	0.7 + 1.9 = 2.6	2.9	2.7	sm
18	0.7 + 1.9 = 2.6	2.9	2.7	sm
19	1.0 + 1.6 = 2.6	2.9	1.6	m
20	0.9 + 1.6 = 2.5	2.8	1.8	sm
21	1.0 + 1.4 = 2.4	2.7	1.4	m
22	0.8 + 1.6 = 2.4	2.7	2.0	sm
23	0.8 + 1.5 = 2.3	2.6	1.9	sm
24	0.8 + 1.5 = 2.3	2.6	1.9	sm
25	0.7 + 1.6 = 2.3	2.6	2.3	sm
26	0.7 + 1.6 = 2.3	2.6	2.3	sm
27	0.9 + 1.3 = 2.2	2.5	1.4	m
28	0.8 + 1.4 = 2.2	2.5	1.8	sm
29	1.0 + 1.1 = 2.1	2.3	1.1	m
30	1.0 + 1.1 = 2.1	2.3	1.1	m
31	0.9 + 1.1 = 2.0	2.2	1.2	m
32	0.9 + 1.1 = 2.0	2.2	1.2	m
33	0.9 + 1.0 = 1.9	2.1	1.1	m
34	0.8 + 1.0 = 1.8	2.0	1.3	m
35	0.6 + 0.6 = 1.2	1.3	1.0	m
36	0.6 + 0.6 = 1.2	1.3	1.0	m

Table 4. Measurements of somatic chromosomes of *Eria javanica*, 2n = 36 at metaphase

Chromosome	Length (μm)	Relative length	Arm ratio	Form
1	2.2 + 2.4 = 4.6	3.9	1.1	m
2	2.0 + 2.4 = 4.4	3.7	1.2	m
3	1.8 + 2.0 = 3.8	3.2	1.1	m
4	1.8 + 2.0 = 3.8	3.2	1.1	m
5	1.3 + 2.5 = 3.8	3.2	1.9	sm
6	1.2 + 2.5 = 3.7	3.2	2.1	sm
7	1.2 + 2.4 = 3.6	3.1	2.0	sm
8	1.1 + 2.4 = 3.5	3.0	2.2	sm
9	1.6 + 1.9 = 3.5	3.0	1.2	m
10	1.6 + 1.9 = 3.5	3.0	1.2	m
11	1.4 + 2.1 = 3.5	3.0	1.5	m
12	1.4 + 2.1 = 3.5	3.0	1.5	m
13	1.6 + 1.9 = 3.5	3.0	1.2	m
14	1.6 + 1.9 = 3.5	3.0	1.2	m
15	1.6 + 1.8 = 3.4	2.8	1.1	m
16	1.6 + 1.8 = 3.4	2.8	1.1	m
17	1.1 + 2.1 = 3.2	2.7	1.9	sm
18	1.1 + 2.1 = 3.2	2.7	1.9	sm
19	0.8 + 2.3 = 3.1	2.6	2.9	sm
20	0.8 + 2.3 = 3.1	2.6	2.9	sm
21	1.3 + 1.8 = 3.1	2.6	1.4	m
22	1.3 + 1.7 = 3.0	2.6	1.4	m
23	1.5 + 1.5= 3.0	2.6	1.0	m
24	1.4 + 1.5 = 2.9	2.5	1.1	m
25	1.5 + 1.5 = 3.0	2.6	1.0	m
26	1.5 + 1.5 = 3.0	2.6	1.0	m
27	1.3 + 1.7 = 3.0	2.6	1.3	m
28	1.3 + 1.7 = 3.0	2.6	1.3	m
29	1.3 + 1.7 = 3.0	2.6	1.3	m
30	1.3 + 1.7 = 3.0	2.6	1.3	m
31	1.1 + 1.9 = 3.0	2.6	1.7	m
32	1.1 + 1.9 = 3.0	2.6	1.7	m
33	1.1 + 1.5 = 2.6	2.2	1.4	m
34	1.1 + 1.5 = 2.6	2.2	1.4	m
35	1.0 + 1.4 = 2.4	2.1	1.4	m
36	1.0 + 1.4 = 2.4	2.1	1.4	m

Table 5. Measurements of somatic chromosomes of *Eria ornata*, 2n = 38 at metaphase

Chromosome	Length (μm)	Relative length	Arm ratio	Form
1	0.9 + 1.8 = 2.7	3.3	2.0	sm
2	0.9 + 1.8 = 2.7	3.3	2.0	sm
3	1.2 + 1.3 = 2.5	3.0	1.1	m
4	1.2 + 1.3 = 2.5	3.0	1.1	m
5	1.2 + 1.3 = 2.5	3.0	1.1	m
6	1.2 + 1.3 = 2.5	3.0	1.1	m
7	1.2 + 1.3 = 2.5	3.0	1.1	m
8	1.2 + 1.2 = 2.4	2.9	1.0	m
9	1.0 + 1.4 = 2.4	2.9	1.4	m
10	0.9 + 1.5 = 2.4	2.9	1.7	m
11	0.9 + 1.5 = 2.4	2.9	1.7	m
12	0.9 + 1.5 = 2.4	2.9	1.7	m
13	0.9 + 1.5 = 2.4	2.9	1.7	m
14	0.8 + 1.6 = 2.4	2.9	2.0	sm
15	0.9 + 1.4 = 2.3	2.8	1.6	m
16	1.0 + 1.2 = 2.2	2.7	1.2	m
17	1.0 + 1.2 = 2.2	2.7	1.2	m
18	0.7 + 1.5 = 2.2	2.7	2.1	sm
19	0.7 + 1.5 = 2.2	2.7	2.1	sm
20	0.7 + 1.5 = 2.2	2.7	2.1	sm
21	0.9 + 1.2 = 2.1	2.6	1.3	m
22	0.9 + 1.2 = 2.1	2.6	1.3	m
23	0.9 + 1.2 = 2.1	2.6	1.3	m
24	0.9 + 1.2 = 2.1	2.6	1.3	m
25	0.7 + 1.4 = 2.1	2.6	2.0	sm
26	0.7 + 1.4 = 2.1	2.6	2.0	sm
27	0.8 + 1.2 = 2.0	2.4	1.5	m
28	0.8 + 1.2 = 2.0	2.4	1.5	m
29	0.8 + 1.2 = 2.0	2.4	1.5	m
30	0.8 + 1.1 = 1.9	2.3	1.4	m
31	0.8 + 1.1 = 1.9	2.3	1.4	m
32	0.5 + 1.4 = 1.9	2.3	2.8	sm
33	0.7 + 1.1 = 1.8	2.2	1.6	m
34	0.7 + 1.1 = 1.8	2.2	1.6	m
35	0.7 + 1.0 = 1.7	2.1	1.4	m
36	0.7 + 1.0 = 1.7	2.1	1.4	m
37	0.6 + 0.9 = 1.5	1.8	1.5	m
38	0.6 + 0.9 = 1.5	1.8	1.5	m

Table 6. Measurements of somatic chromosomes of *Eria pannea*, 2n = 38 at metaphase

Chromosome	Length (μm)	Relative length	Arm ratio	Form
1	1.0 + 1.3 = 2.3	4.0	1.3	m
2	1.0 + 1.2 = 2.2	3.8	1.2	m
3	0.9 + 1.0 = 1.9	3.3	1.1	m
4	0.9 + 1.0 = 1.9	3.3	1.1	m
5	0.8 + 1.0 = 1.8	3.1	1.3	m
6	0.8 + 0.9 = 1.7	3.0	1.1	m
7	0.7 + 1.0 = 1.7	3.0	1.4	m
8	0.7 + 1.0 = 1.7	3.0	1.4	m
9	0.7 + 1.0 = 1.7	3.0	1.4	m
10	0.7 + 1.0 = 1.7	3.0	1.4	m
11	0.8 + 0.8 = 1.6	2.8	1.0	m
12	0.8 + 0.8 = 1.6	2.8	1.0	m
13	0.7 + 0.9 = 1.6	2.8	1.3	m
14	0.7 + 0.9 = 1.6	2.8	1.3	m
15	0.7 + 0.8 = 1.5	2.6	1.1	m
16	0.7 + 0.8 = 1.5	2.6	1.1	m
17	0.7 + 0.8 = 1.5	2.6	1.1	m
18	0.7 + 0.8 = 1.5	2.6	1.1	m
19	0.6 + 0.9 = 1.5	2.6	1.5	m
20	0.6 + 0.9 = 1.5	2.6	1.5	m
21	0.7 + 0.7 = 1.4	2.4	1.0	m
22	0.7 + 0.7 = 1.4	2.4	1.0	m
23	0.7 + 0.7 = 1.4	2.4	1.0	m
24	0.7 + 0.7 = 1.4	2.4	1.0	m
25	0.6 + 0.8 = 1.4	2.4	1.3	m
26	0.6 + 0.8 = 1.4	2.4	1.3	m
27	0.6 + 0.7 = 1.3	2.3	1.2	m
28	0.6 + 0.7 = 1.3	2.3	1.2	m
29	0.6 + 0.7 = 1.3	2.3	1.2	m
30	0.6 + 0.7 = 1.3	2.3	1.2	m
31	0.4 + 0.9 = 1.3	2.3	2.3	sm
32	0.4 + 0.9 = 1.3	2.3	2.3	sm
33	0.4 + 0.9 = 1.3	2.3	2.3	sm
34	0.4 + 0.9 = 1.3	2.3	2.3	sm
35	0.5 + 0.7 = 1.2	2.1	1.4	m
36	0.5 + 0.7 = 1.2	2.1	1.4	m
37	0.4 + 0.6 = 1.0	1.9	1.5	m
38	0.4 + 0.6 = 1.0	1.9	1.5	m

Table 7. Measurements of somatic chromosomes of *Eria stricta*, 2n = 40 at metaphase

Chromosome	Length (μm)	Relative length	Arm ratio	Form
1	0.9 + 1.3 = 2.2	3.6	1.4	m
2	0.9 + 1.3 = 2.2	3.6	1.4	m
3	0.9 + 1.1 = 2.0	3.3	1.2	m
4	0.9 + 1.1 = 2.0	3.3	1.2	m
5	0.7 + 1.1 = 1.8	3.0	1.6	m
6	0.8 + 1.0 = 1.8	3.0	1.3	m
7	0.8 + 1.0 = 1.8	3.0	1.3	m
8	0.9 + 0.9 = 1.8	3.0	1.0	m
9	0.8 + 0.9 = 1.7	2.8	1.1	m
10	0.8 + 0.9 = 1.7	2.8	1.1	m
11	0.7 + 1.0 = 1.7	2.8	1.4	m
12	0.7 + 1.0 = 1.7	2.8	1.4	m
13	0.7 + 0.9 = 1.6	2.6	1.3	m
14	0.7 + 0.9 = 1.6	2.6	1.3	m
15	0.7 + 0.9 = 1.6	2.6	1.3	m
16	0.7 + 0.9 = 1.6	2.6	1.3	m
17	0.7 + 0.8 = 1.5	2.5	1.1	m
18	0.7 + 0.8 = 1.5	2.5	1.1	m
19	0.6 + 0.9 = 1.5	2.5	1.5	m
20	0.6 + 0.9 = 1.5	2.5	1.5	m
21	0.6 + 0.8 = 1.4	2.3	1.3	m
22	0.6 + 0.8 = 1.4	2.3	1.3	m
23	0.6 + 0.8 = 1.4	2.3	1.3	m
24	0.6 + 0.8 = 1.4	2.3	1.3	m
25	0.6 + 0.8 = 1.4	2.3	1.3	m
26	0.6 + 0.8 = 1.4	2.3	1.3	m
27	0.7 + 0.7 = 1.4	2.3	1.0	m
28	0.7 + 0.7 = 1.4	2.3	1.0	m
29	0.6 + 0.7 = 1.3	2.1	1.2	m
30	0.6 + 0.7 = 1.3	2.1	1.2	m
31	0.5 + 0.8 = 1.3	2.1	1.6	m
32	0.5 + 0.8 = 1.3	2.1	1.6	m
33	0.5 + 0.8 = 1.3	2.1	1.6	m
34	0.5 + 0.8 = 1.3	2.1	1.6	m
35	0.4 + 0.9 = 1.3	2.1	2.3	sm
36	0.4 + 0.9 = 1.3	2.1	2.3	sm
37	0.5 + 0.6 = 1.1	1.8	1.2	m
38	0.5 + 0.6 = 1.1	1.8	1.2	m
39	0.5 + 0.5 = 1.0	1.7	1.0	m
40	0.5 + 0.5 = 1.0	1.7	1.0	m

Table 8. Measurements of somatic chromosomes of *Eria coronaria*, 2n = 36 at metaphase

Chromosome	Length (μm)	Relative length	Arm ratio	Form
1	1.2 + 1.8 = 3.0	3.6	1.5	m
2	1.2 + 1.8 = 3.0	3.6	1.5	m
3	1.2 + 1.8 = 3.0	3.6	1.5	m
4	1.3 + 1.6 = 2.9	3.4	1.2	m
5	1.2 + 1.6 = 2.8	3.3	1.3	m
6	1.1 + 1.7 = 2.8	3.3	1.5	m
7	1.1 + 1.6 = 2.7	3.2	1.5	m
8	1.1 + 1.6 = 2.7	3.2	1.5	m
9	1.1 + 1.6 = 2.7	3.2	1.5	m
10	1.0 + 1.7 = 2.7	3.2	1.7	m
11	1.0 + 1.7 = 2.7	3.2	1.7	m
12	0.6 + 2.1 = 2.7	3.2	3.5	st
13	1.1 + 1.5 = 2.6	3.1	1.4	m
14	1.0 + 1.6 = 2.6	3.1	1.6	m
15	0.9 + 1.7 = 2.6	3.1	1.9	sm
16	0.9 + 1.6 = 2.5	3.0	1.9	sm
17	1.1 + 1.3 = 2.4	2.8	1.2	m
18	1.1 + 1.3 = 2.4	2.8	1.2	m
19	1.1 + 1.3 = 2.4	2.8	1.2	m
20	1.0 + 1.4 = 2.4	2.8	1.4	m
21	0.9 + 1.5 = 2.4	2.8	1.7	m
22	0.9 + 1.4 = 2.3	2.7	1.6	m
23	0.9 + 1.4 = 2.3	2.7	1.6	m
24	0.5 + 1.8 = 2.3	2.7	3.6	st
25	0.8 + 1.4 = 2.2	2.6	1.8	sm
26	0.6 + 1.5 = 2.1	2.5	2.5	sm
27	0.6 + 1.5 = 2.1	2.5	2.5	sm
28	0.6 + 1.4 = 2.0	2.4	2.3	sm
29	0.6 + 1.3 = 1.9	2.3	2.2	sm
30	0.6 + 1.3 = 1.9	2.3	2.2	sm
31	0.7 + 1.1 = 1.8	2.1	1.6	m
32	0.8 + 0.9 = 1.7	2.0	1.1	m
33	0.7 + 0.8 = 1.5	1.8	1.1	m
34	0.6 + 0.9 = 1.5	1.8	1.5	m
35	0.5 + 0.9 = 1.4	1.7	1.8	sm
36	0.5 + 0.9 = 1.4	1.7	1.8	sm

Table 9. Measurements of somatic chromosomes of *Eria biflora*, 2n = 46 at metaphase

Chromosome	Length (μm)	Relative length	Arm ratio	Form
1	1.0 + 1.9 = 2.9	3.8	1.9	sm
2	1.0 + 1.7 = 2.7	3.5	1.7	m
3	0.9 + 1.8 = 2.7	3.5	2.0	sm
4	1.1 + 1.3 = 2.4	3.1	1.2	m
5	0.8 + 1.4 = 2.2	2.9	1.8	sm
6	0.8 + 1.3 = 2.1	2.7	1.6	m
7	0.9 + 1.2 = 2.1	2.7	1.3	m
8	0.9 + 1.0 = 1.9	2.5	1.1	m
9	0.9 + 1.0 = 1.9	2.5	1.1	m
10	0.9 + 1.0 = 1.9	2.5	1.1	m
11	0.9 + 1.0 = 1.9	2.5	1.1	m
12	0.9 + 1.0 = 1.9	2.5	1.1	m
13	0.8 + 1.1 = 1.9	2.5	1.4	m
14	0.6 + 1.3 = 1.9	2.5	2.2	sm
15	0.9 + 0.9 = 1.8	2.3	1.0	m
16	0.9 + 0.9 = 1.8	2.3	1.0	m
17	0.9 + 0.9 = 1.8	2.3	1.0	m
18	0.9 + 0.9 = 1.8	2.3	1.0	m
19	0.8 + 0.9 = 1.7	2.2	1.1	m
20	0.8 + 0.9 = 1.7	2.2	1.1	m
21	0.8 + 0.9 = 1.7	2.2	1.1	m
22	0.8 + 0.9 = 1.7	2.2	1.1	m
23	0.7 + 0.9 = 1.6	2.1	1.3	m
24	0.7 + 0.9 = 1.6	2.1	1.3	m
25	0.7 + 0.8 = 1.5	2.0	1.1	m
26	0.7 + 0.8 = 1.5	2.0	1.1	m
27	0.7 + 0.8 = 1.5	2.0	1.1	m
28	0.7 + 0.8 = 1.5	2.0	1.1	m
29	0.7 + 0.8 = 1.5	2.0	1.1	m
30	0.7 + 0.8 = 1.5	2.0	1.1	m
31	0.6 + 0.8 = 1.4	1.8	1.3	m
32	0.6 + 0.8 = 1.4	1.8	1.3	m
33	0.7 + 0.7 = 1.4	1.8	1.0	m
34	0.7 + 0.7 = 1.4	1.8	1.0	m
35	0.6 + 0.7 = 1.3	1.7	1.2	m
36	0.5 + 0.8 = 1.3	1.7	1.6	m
37	0.5 + 0.8 = 1.3	1.7	1.6	m
38	0.6 + 0.7 = 1.3	1.7	1.2	m
39	0.6 + 0.6 = 1.2	1.6	1.0	m
40	0.6 + 0.6 = 1.2	1.6	1.0	m
41	0.5 + 0.7 = 1.2	1.6	1.4	m
42	0.5 + 0.7 = 1.2	1.6	1.4	m
43	0.5 + 0.7 = 1.2	1.6	1.4	m
44	0.5 + 0.7 = 1.2	1.6	1.4	m
45	0.5 + 0.6 = 1.1	1.4	1.2	m
46	0.5 + 0.6 = 1.1	1.4	1.2	m

Table 10. Measurements of somatic chromosomes of *Eria floribunda*, 2n = 38 at metaphase

Chromosome	Length (μm)	Relative length	Arm ratio	Form
1	0.7 + 0.8 = 1.5	4.5	1.1	m
2	0.7 + 0.8 = 1.5	4.5	1.1	m
3	0.5 + 0.7 = 1.2	3.6	1.4	m
4	0.5 + 0.7 = 1.2	3.6	1.4	m
5	0.5 + 0.6 = 1.1	3.3	1.2	m
6	0.5 + 0.6 = 1.1	3.3	1.2	m
7	0.4 + 0.6 = 1.0	3.0	1.5	m
8	0.4 + 0.6 = 1.0	3.0	1.5	m
9	0.4 + 0.6 = 1.0	3.0	1.5	m
10	0.4 + 0.6 = 1.0	3.0	1.5	m
11	0.4 + 0.6 = 1.0	3.0	1.5	m
12	0.4 + 0.6 = 1.0	3.0	1.5	m
13	0.3 + 0.6 = 0.9	2.7	2.0	sm
14	0.3 + 0.6 = 0.9	2.7	2.0	sm
15	0.4 + 0.4 = 0.8	2.4	1.0	m
16	0.4 + 0.4 = 0.8	2.4	1.0	m
17	0.4 + 0.4 = 0.8	2.4	1.0	m
18	0.4 + 0.4 = 0.8	2.4	1.0	m
19	0.3 + 0.5 = 0.8	2.4	1.7	m
20	0.3 + 0.5 = 0.8	2.4	1.7	m
21	0.3 + 0.5 = 0.8	2.4	1.7	m
22	0.3 + 0.5 = 0.8	2.4	1.7	m
23	0.3 + 0.5 = 0.8	2.4	1.7	m
24	0.3 + 0.5 = 0.8	2.4	1.7	m
25	0.3 + 0.5 = 0.8	2.4	1.7	m
26	0.3 + 0.5 = 0.8	2.4	1.7	m
27	0.3 + 0.4 = 0.7	2.1	1.3	m
28	0.3 + 0.4 = 0.7	2.1	1.3	m
29	0.3 + 0.4 = 0.7	2.1	1.3	m
30	0.3 + 0.4 = 0.7	2.1	1.3	m
31	0.3 + 0.4 = 0.7	2.1	1.3	m
32	0.3 + 0.4 = 0.7	2.1	1.3	m
33	0.3 + 0.4 = 0.7	2.1	1.3	m
34	0.3 + 0.4 = 0.7	2.1	1.3	m
35	0.3 + 0.4 = 0.7	2.1	1.3	m
36	0.3 + 0.4 = 0.7	2.1	1.3	m
37	0.3 + 0.4 = 0.7	2.1	1.3	m
38	0.3 + 0.4 = 0.7	2.1	1.3	m

Table 11. Measurements of somatic chromosomes of *Eria pachystachya*, 2n=38 at metaphase

Chromosome	Length (μm)	Relative length	Arm ratio	Form
1	0.8 + 1.0 = 1.8	4.0	1.3	m
2	0.8 + 1.0 = 1.8	4.0	1.3	m
3	0.6 + 1.0 = 1.6	3.5	1.7	m
4	0.6 + 0.9 = 1.5	3.3	1.5	m
5	0.6 + 0.8 = 1.4	3.1	1.3	m
6	0.6 + 0.8 = 1.4	3.1	1.3	m
7	0.6 + 0.8 = 1.4	3.1	1.3	m
8	0.6 + 0.8 = 1.4	3.1	1.3	m
9	0.6 + 0.8 = 1.4	3.1	1.3	m
10	0.6 + 0.8 = 1.4	3.1	1.3	m
11	0.6 + 0.7 = 1.3	2.9	1.2	m
12	0.6 + 0.7 = 1.3	2.9	1.2	m
13	0.6 + 0.6 = 1.2	2.6	1.0	m
14	0.6 + 0.6 = 1.2	2.6	1.0	m
15	0.5 + 0.7 = 1.2	2.6	1.4	m
16	0.5 + 0.7 = 1.2	2.6	1.4	m
17	0.4 + 0.8 = 1.2	2.6	2.0	sm
18	0.4 + 0.8 = 1.2	2.6	2.0	sm
19	0.4 + 0.8 = 1.2	2.6	2.0	sm
20	0.4 + 0.8 = 1.2	2.6	2.0	sm
21	0.5 + 0.6 = 1.1	2.4	1.2	m
22	0.5 + 0.6 = 1.1	2.4	1.2	m
23	0.5 + 0.6 = 1.1	2.4	1.2	m
24	0.5 + 0.6 = 1.1	2.4	1.2	m
25	0.5 + 0.6 = 1.1	2.4	1.2	m
26	0.5 + 0.6 = 1.1	2.4	1.2	m
27	0.4 + 0.6 = 1.0	2.2	1.5	m
28	0.4 + 0.6 = 1.0	2.2	1.5	m
29	0.4 + 0.6 = 1.0	2.2	1.5	m
30	0.4 + 0.6 = 1.0	2.2	1.5	m
31	0.4 + 0.6 = 1.0	2.2	1.5	m
32	0.4 + 0.6 = 1.0	2.2	1.5	m
33	0.4 + 0.5 = 0.9	2.0	1.3	m
34	0.4 + 0.5 = 0.9	2.0	1.3	m
35	0.4 + 0.5 = 0.9	2.0	1.3	m
36	0.4 + 0.5 = 0.9	2.0	1.3	m
37	0.4 + 0.5 = 0.9	2.0	1.3	m
38	0.4 + 0.5 = 0.9	2.0	1.3	m

Table 12. Measurements of somatic chromosomes of *Eria acervata*, 2n = 38 at metaphase

Chromosome	Length (μm)	Relative length	Arm ratio	Form
1	0.7 + 1.0 = 1.7	3.6	1.4	m
2	0.7 + 1.0 = 1.7	3.6	1.4	m
3	0.8 + 0.9 = 1.7	3.6	1.1	m
4	0.8 + 0.9 = 1.7	3.6	1.1	m
5	0.7 + 0.8 = 1.5	3.1	1.1	m
6	0.7 + 0.8 = 1.5	3.1	1.1	m
7	0.7 + 0.8 = 1.5	3.1	1.1	m
8	0.7 + 0.8 = 1.5	3.1	1.1	m
9	0.6 + 0.8 = 1.4	2.9	1.3	m
10	0.6 + 0.8 = 1.4	2.9	1.3	m
11	0.6 + 0.8 = 1.4	2.9	1.3	m
12	0.6 + 0.8 = 1.4	2.9	1.3	m
13	0.6 + 0.7 = 1.3	2.7	1.2	m
14	0.6 + 0.7 = 1.3	2.7	1.2	m
15	0.6 + 0.7 = 1.3	2.7	1.2	m
16	0.6 + 0.7 = 1.3	2.7	1.2	m
17	0.5 + 0.8 = 1.3	2.7	1.6	m
18	0.5 + 0.8 = 1.3	2.7	1.6	m
19	0.6 + 0.6 = 1.2	2.5	1.0	m
20	0.6 + 0.6 = 1.2	2.5	1.0	m
21	0.5 + 0.7 = 1.2	2.5	1.4	m
22	0.5 + 0.7 = 1.2	2.5	1.4	m
23	0.5 + 0.7 = 1.2	2.5	1.4	m
24	0.5 + 0.7 = 1.2	2.5	1.4	m
25	0.5 + 0.6 = 1.1	2.3	1.2	m
26	0.5 + 0.6 = 1.1	2.3	1.2	m
27	0.4 + 0.7 = 1.1	2.3	1.8	sm
28	0.4 + 0.7 = 1.1	2.3	1.8	sm
29	0.4 + 0.7 = 1.1	2.3	1.8	sm
30	0.4 + 0.7 = 1.1	2.3	1.8	sm
31	0.3 + 0.8 = 1.1	2.3	2.7	sm
32	0.3 + 0.8 = 1.1	2.3	2.7	sm
33	0.4 + 0.6 = 1.0	2.1	1.5	m
34	0.4 + 0.6 = 1.0	2.1	1.5	m
35	0.4 + 0.5 = 0.9	1.9	1.3	m
36	0.4 + 0.5 = 0.9	1.9	1.3	m
37	0.4 + 0.5 = 0.9	1.9	1.3	m
38	0.4 + 0.5 = 0.9	1.9	1.3	m

Table 13. Measurements of somatic chromosomes of *Eria bractescens*, 2n = 38 at metaphase

Chromosome	Length (μm)	Relative length	Arm ratio	Form
1	1.3 + 1.4 = 2.7	4.2	1.1	m
2	1.3 + 1.4 = 2.7	4.2	1.1	m
3	1.0 + 1.0 = 2.0	3.1	1.0	m
4	1.0 + 1.0 = 2.0	3.1	1.0	m
5	0.9 + 1.1 = 2.0	3.1	1.2	m
6	0.9 + 1.1 = 2.0	3.1	1.2	m
7	0.7 + 1.2 = 1.9	3.0	1.7	m
8	0.7 + 1.2 = 1.9	3.0	1.7	m
9	0.9 + 1.0 = 1.9	3.0	1.1	m
10	0.9 + 1.0 = 1.9	3.0	1.1	m
11	0.8 + 1.0 = 1.8	2.8	1.3	m
12	0.8 + 1.0 = 1.8	2.8	1.3	m
13	0.8 + 1.0 = 1.8	2.8	1.3	m
14	0.8 + 1.0 = 1.8	2.8	1.3	m
15	0.8 + 0.9 = 1.7	2.6	1.1	m
16	0.8 + 0.9 = 1.7	2.6	1.1	m
17	0.8 + 0.9 = 1.7	2.6	1.1	m
18	0.8 + 0.9 = 1.7	2.6	1.1	m
19	0.8 + 0.9 = 1.7	2.6	1.1	m
20	0.8 + 0.9 = 1.7	2.6	1.1	m
21	0.7 + 0.9 = 1.6	2.5	1.3	m
22	0.7 + 0.9 = 1.6	2.5	1.3	m
23	0.7 + 0.9 = 1.6	2.5	1.3	m
24	0.7 + 0.9 = 1.6	2.5	1.3	m
25	0.7 + 0.9 = 1.6	2.5	1.3	m
26	0.7 + 0.9 = 1.6	2.5	1.3	m
27	0.7 + 0.8 = 1.5	2.3	1.1	m
28	0.7 + 0.8 = 1.5	2.3	1.1	m
29	0.6 + 0.9 = 1.5	2.3	1.5	m
30	0.6 + 0.9 = 1.5	2.3	1.5	m
31	0.6 + 0.8 = 1.4	2.2	1.3	m
32	0.6 + 0.8 = 1.4	2.2	1.3	m
33	0.6 + 0.7 = 1.3	2.0	1.2	m
34	0.6 + 0.7 = 1.3	2.0	1.2	m
35	0.5 + 0.7 = 1.2	1.9	1.4	m
36	0.5 + 0.7 = 1.2	1.9	1.4	m
37	0.5 + 0.7 = 1.2	1.9	1.4	m
38	0.5 + 0.7 = 1.2	1.9	1.4	m

Table 14. Measurements of somatic chromosomes of *Eria graminifolia*, 2n = 42 at metaphase

Chromosome	Length (μm)	Relative length	Arm ratio	Form
1	0.6 + 1.0 = 1.6	3.5	1.7	m
2	0.6 + 1.0 = 1.6	3.5	1.7	m
3	0.4 + 0.9 = 1.3	2.9	2.3	sm
4	0.4 + 0.9 = 1.3	2.9	2.3	sm
5	0.4 + 0.9 = 1.3	2.9	2.3	sm
6	0.4 + 0.9 = 1.3	2.9	2.3	sm
7	0.4 + 0.9 = 1.3	2.9	2.3	sm
8	0.4 + 0.9 = 1.3	2.9	2.3	sm
9	0.4 + 0.9 = 1.3	2.9	2.3	sm
10	0.5 + 0.7 = 1.2	2.7	1.4	m
11	0.5 + 0.7 = 1.2	2.7	1.4	m
12	0.5 + 0.7 = 1.2	2.7	1.4	m
13	0.4 + 0.8 = 1.2	2.7	2.0	sm
14	0.4 + 0.8 = 1.2	2.7	2.0	sm
15	0.5 + 0.6 = 1.1	2.4	1.2	m
16	0.5 + 0.6 = 1.1	2.4	1.2	m
17	0.5 + 0.6 = 1.1	2.4	1.2	m
18	0.5 + 0.6 = 1.1	2.4	1.2	m
19	0.4 + 0.7 = 1.1	2.4	1.8	sm
20	0.5 + 0.5 = 1.0	2.2	1.0	m
21	0.5 + 0.5 = 1.0	2.2	1.0	m
22	0.5 + 0.5 = 1.0	2.2	1.0	m
23	0.5 + 0.5 = 1.0	2.2	1.0	m
24	0.5 + 0.5 = 1.0	2.2	1.0	m
25	0.5 + 0.5 = 1.0	2.2	1.0	m
26	0.5 + 0.5 = 1.0	2.2	1.0	m
27	0.5 + 0.5 = 1.0	2.2	1.0	m
28	0.5 + 0.5 = 1.0	2.2	1.0	m
29	0.3 + 0.7 = 1.0	2.2	2.3	sm
30	0.3 + 0.7 = 1.0	2.2	2.3	sm
31	0.3 + 0.7 = 1.0	2.2	2.3	sm
32	0.3 + 0.7 = 1.0	2.2	2.3	sm
33	0.3 + 0.6 = 0.9	2.0	2.0	sm
34	0.3 + 0.6 = 0.9	2.0	2.0	sm
35	0.3 + 0.6 = 0.9	2.0	2.0	sm
36	0.3 + 0.6 = 0.9	2.0	2.0	sm
37	0.3 + 0.5 = 0.8	1.8	1.7	m
38	0.3 + 0.5 = 0.8	1.8	1.7	m
39	0.3 + 0.5 = 0.8	1.8	1.7	m
40	0.3 + 0.5 = 0.8	1.8	1.7	m
41	0.3 + 0.5 = 0.8	1.8	1.7	m
42	0.3 + 0.5 = 0.8	1.8	1.7	m

Table 15. Measurements of somatic chromosomes of *Eria hyacinsoides*, 2n = 38 at metaphase

Chromosome	Length (μm)	Relative length	Arm ratio	Form
1	0.8 + 1.0 = 1.8	3.2	1.3	m
2	0.8 + 1.0 = 1.8	3.2	1.3	m
3	0.7 + 1.1 = 1.8	3.2	1.6	m
4	0.7 + 1.1 = 1.8	3.2	1.6	m
5	0.7 + 1.1 = 1.8	3.2	1.6	m
6	0.7 + 1.1 = 1.8	3.2	1.6	m
7	0.8 + 0.9 = 1.7	3.0	1.1	m
8	0.8 + 0.9 = 1.7	3.0	1.1	m
9	0.6 + 1.1 = 1.7	3.0	1.8	sm
10	0.6 + 1.1 = 1.7	3.0	1.8	sm
11	0.7 + 0.9 = 1.6	2.8	1.3	m
12	0.7 + 0.9 = 1.6	2.8	1.3	m
13	0.7 + 0.9 = 1.6	2.8	1.3	m
14	0.7 + 0.9 = 1.6	2.8	1.3	m
15	0.7 + 0.9 = 1.6	2.8	1.3	m
16	0.7 + 0.9 = 1.6	2.8	1.3	m
17	0.7 + 0.8 = 1.5	2.6	1.1	m
18	0.7 + 0.8 = 1.5	2.6	1.1	m
19	0.7 + 0.8 = 1.5	2.6	1.1	m
20	0.7 + 0.8 = 1.5	2.6	1.1	m
21	0.7 + 0.8 = 1.5	2.6	1.1	m
22	0.7 + 0.8 = 1.5	2.6	1.1	m
23	0.6 + 0.9 = 1.5	2.6	1.5	m
24	0.6 + 0.9 = 1.5	2.6	1.5	m
25	0.7 + 0.7 = 1.4	2.5	1.0	m
26	0.7 + 0.7 = 1.4	2.5	1.0	m
27	0.7 + 0.7 = 1.4	2.5	1.0	m
28	0.7 + 0.7 = 1.4	2.5	1.0	m
29	0.6 + 0.7 = 1.3	2.3	1.2	m
30	0.6 + 0.7 = 1.3	2.3	1.2	m
31	0.6 + 0.7 = 1.3	2.3	1.2	m
32	0.6 + 0.7 = 1.3	2.3	1.2	m
33	0.5 + 0.7 = 1.2	2.1	1.4	m
34	0.5 + 0.7 = 1.2	2.1	1.4	m
35	0.5 + 0.7 = 1.2	2.1	1.4	m
36	0.5 + 0.7 = 1.2	2.1	1.4	m
37	0.5 + 0.7 = 1.2	2.1	1.4	m
38	0.4 + 0.6 = 1.0	1.8	1.5	m

Table 16. Measurements of somatic chromosomes of *Eria ovata*, 2n = 38 at metaphase

Chromosome	Length (μm)	Relative length	Arm ratio	Form
1	0.8 + 1.2 = 2.0	4.1	1.5	m
2	0.8 + 1.2 = 2.0	4.1	1.5	m
3	0.7 + 0.9 = 1.6	3.3	1.3	m
4	0.6 + 1.0 = 1.6	3.3	1.7	m
5	0.7 + 0.8 = 1.5	3.1	1.1	m
6	0.7 + 0.8 = 1.5	3.1	1.1	m
7	0.7 + 0.8 = 1.5	3.1	1.1	m
8	0.7 + 0.8 = 1.5	3.1	1.1	m
9	0.6 + 0.9 = 1.5	3.1	1.5	m
10	0.6 + 0.9 = 1.5	3.1	1.5	m
11	0.6 + 0.8 = 1.4	2.9	1.3	m
12	0.6 + 0.8 = 1.4	2.9	1.3	m
13	0.5 + 0.9 = 1.4	2.9	1.8	sm
14	0.5 + 0.9 = 1.4	2.9	1.8	sm
15	0.6 + 0.7 = 1.3	2.7	1.2	m
16	0.6 + 0.7 = 1.3	2.7	1.2	m
17	0.6 + 0.7 = 1.3	2.7	1.2	m
18	0.6 + 0.7 = 1.3	2.7	1.2	m
19	0.5 + 0.8 = 1.3	2.7	1.6	m
20	0.5 + 0.8 = 1.3	2.7	1.6	m
21	0.5 + 0.7 = 1.2	2.4	1.4	m
22	0.5 + 0.7 = 1.2	2.4	1.4	m
23	0.6 + 0.6 = 1.2	2.4	1.0	m
24	0.6 + 0.6 = 1.2	2.4	1.0	m
25	0.6 + 0.6 = 1.2	2.4	1.0	m
26	0.6 + 0.6 = 1.2	2.4	1.0	m
27	0.5 + 0.6 = 1.1	2.2	1.2	m
28	0.5 + 0.6 = 1.1	2.2	1.2	m
29	0.5 + 0.6 = 1.1	2.2	1.2	m
30	0.5 + 0.6 = 1.1	2.2	1.2	m
31	0.5 + 0.5 = 1.0	2.0	1.0	m
32	0.5 + 0.5 = 1.0	2.0	1.0	m
33	0.5 + 0.5 = 1.0	2.0	1.0	m
34	0.5 + 0.5 = 1.0	2.0	1.0	m
35	0.4 + 0.6 = 1.0	2.0	1.5	m
36	0.4 + 0.6 = 1.0	2.0	1.5	m
37	0.4 + 0.5 = 0.9	1.8	1.2	m
38	0.4 + 0.5 = 0.9	1.8	1.2	m

Table 17. Measurements of somatic chromosomes of *Eria reptans*, 2n = 38 at metaphase

Chromosome	Length (μm)	Relative length	Arm ratio	Form
1	1.0 + 1.1 = 2.1	4.0	1.1	m
2	1.0 + 1.1 = 2.1	4.0	1.1	m
3	0.9 + 1.0 = 1.9	3.6	1.1	m
4	0.9 + 1.0 = 1.9	3.6	1.1	m
5	0.8 + 0.9 = 1.7	3.2	1.1	m
6	0.8 + 0.9 = 1.7	3.2	1.1	m
7	0.7 + 0.9 = 1.6	3.0	1.3	m
8	0.7 + 0.9 = 1.6	3.0	1.3	m
9	0.7 + 0.9 = 1.6	3.0	1.3	m
10	0.7 + 0.9 = 1.6	3.0	1.3	m
11	0.6 + 0.9 = 1.5	2.8	1.5	m
12	0.6 + 0.9 = 1.5	2.8	1.5	m
13	0.6 + 0.8 = 1.4	2.7	1.3	m
14	0.6 + 0.8 = 1.4	2.7	1.3	m
15	0.6 + 0.8 = 1.4	2.7	1.3	m
16	0.6 + 0.8 = 1.4	2.7	1.3	m
17	0.5 + 0.9 = 1.4	2.7	1.8	sm
18	0.5 + 0.9 = 1.4	2.7	1.8	sm
19	0.6 + 0.7 = 1.3	2.5	1.2	m
20	0.6 + 0.7 = 1.3	2.5	1.2	m
21	0.6 + 0.7 = 1.3	2.5	1.2	m
22	0.6 + 0.7 = 1.3	2.5	1.2	m
23	0.6 + 0.7 = 1.3	2.5	1.2	m
24	0.6 + 0.7 = 1.3	2.5	1.2	m
25	0.5 + 0.7 = 1.2	2.3	1.4	m
26	0.5 + 0.7 = 1.2	2.3	1.4	m
27	0.5 + 0.7 = 1.2	2.3	1.4	m
28	0.5 + 0.7 = 1.2	2.3	1.4	m
29	0.5 + 0.7 = 1.2	2.3	1.4	m
30	0.5 + 0.7 = 1.2	2.3	1.4	m
31	0.5 + 0.6 = 1.1	2.1	1.2	m
32	0.5 + 0.6 = 1.1	2.1	1.2	m
33	0.5 + 0.6 = 1.1	2.1	1.2	m
34	0.5 + 0.6 = 1.1	2.1	1.2	m
35	0.5 + 0.6 = 1.1	2.1	1.2	m
36	0.5 + 0.6 = 1.1	2.1	1.2	m
37	0.5 + 0.5 = 1.0	1.9	1.0	m
38	0.5 + 0.5 = 1.0	1.9	1.0	m

Table 18. Measurements of somatic chromosomes of *Eria spicata*, 2n = 38 at metaphase

Chromosome	Length (μm)	Relative length	Arm ratio	Form
1	1.0 + 1.2 = 2.2	5.1	1.2	m
2	1.0 + 1.2 = 2.2	5.1	1.2	m
3	0.5 + 1.3 = 1.8	4.2	2.6	sm
4	0.7 + 0.9 = 1.6	3.7	1.3	m
5	0.7 + 0.8 = 1.5	3.5	1.1	m
6	0.6 + 0.8 = 1.4	3.2	1.3	m
7	0.5 + 0.7 = 1.2	2.8	1.4	m
8	0.5 + 0.7 = 1.2	2.8	1.4	m
9	0.5 + 0.7 = 1.2	2.8	1.4	m
10	0.5 + 0.7 = 1.2	2.8	1.4	m
11	0.5 + 0.7 = 1.2	2.8	1.4	m
12	0.5 + 0.7 = 1.2	2.8	1.4	m
13	0.5 + 0.6 = 1.1	2.6	1.2	m
14	0.5 + 0.6 = 1.1	2.6	1.2	m
15	0.4 + 0.7 = 1.1	2.6	1.8	sm
16	0.4 + 0.7 = 1.1	2.6	1.8	sm
17	0.4 + 0.7 = 1.1	2.6	1.8	sm
18	0.4 + 0.7 = 1.1	2.6	1.8	sm
19	0.5 + 0.5 = 1.0	2.3	1.0	m
20	0.5 + 0.5 = 1.0	2.3	1.0	m
21	0.5 + 0.5 = 1.0	2.3	1.0	m
22	0.5 + 0.5 = 1.0	2.3	1.0	m
23	0.5 + 0.5 = 1.0	2.3	1.0	m
24	0.5 + 0.5 = 1.0	2.3	1.0	m
25	0.4 + 0.5 = 0.9	2.1	1.3	m
26	0.4 + 0.5 = 0.9	2.1	1.3	m
27	0.4 + 0.5 = 0.9	2.1	1.3	m
28	0.4 + 0.5 = 0.9	2.1	1.3	m
29	0.4 + 0.5 = 0.9	2.1	1.3	m
30	0.4 + 0.5 = 0.9	2.1	1.3	m
31	0.4 + 0.5 = 0.9	2.1	1.3	m
32	0.4 + 0.5 = 0.9	2.1	1.3	m
33	0.4 + 0.5 = 0.9	2.1	1.3	m
34	0.4 + 0.5 = 0.9	2.1	1.3	m
35	0.4 + 0.5 = 0.9	2.1	1.3	m
36	0.4 + 0.5 = 0.9	2.1	1.3	m
37	0.4 + 0.5 = 0.9	2.1	1.3	m
38	0.4 + 0.5 = 0.9	2.1	1.3	m

Table 19. Measurements of somatic chromosomes of *Eria tomentosiflora*, 2n=38 at metaphase

Chromosome	Length (μm)	Relative length	Arm ratio	Form
1	1.2 + 1.3 = 2.5	4.2	1.1	m
2	1.2 + 1.3 = 2.5	4.2	1.1	m
3	0.9 + 1.1 = 2.0	3.3	1.2	m
4	0.9 + 1.1 = 2.0	3.3	1.2	m
5	0.9 + 1.0 = 1.9	3.2	1.1	m
6	0.9 + 1.0 = 1.9	3.2	1.1	m
7	0.9 + 0.9 = 1.8	3.0	1.0	m
8	0.9 + 0.9 = 1.8	3.0	1.0	m
9	0.8 + 0.9 = 1.7	2.8	1.1	m
10	0.8 + 0.9 = 1.7	2.8	1.1	m
11	0.7 + 1.0 = 1.7	2.8	1.4	m
12	0.7 + 1.0 = 1.7	2.8	1.4	m
13	0.7 + 1.0 = 1.7	2.8	1.4	m
14	0.7 + 1.0 = 1.7	2.8	1.4	m
15	0.6 + 1.0 = 1.6	2.7	1.7	m
16	0.6 + 1.0 = 1.6	2.7	1.7	m
17	0.7 + 0.8 = 1.5	2.5	1.1	m
18	0.7 + 0.8 = 1.5	2.5	1.1	m
19	0.7 + 0.8 = 1.5	2.5	1.1	m
20	0.7 + 0.8 = 1.5	2.5	1.1	m
21	0.7 + 0.8 = 1.5	2.5	1.1	m
22	0.7 + 0.8 = 1.5	2.5	1.1	m
23	0.7 + 0.8 = 1.5	2.5	1.1	m
24	0.7 + 0.8 = 1.5	2.5	1.1	m
25	0.6 + 0.8 = 1.4	2.3	1.3	m
26	0.6 + 0.8 = 1.4	2.3	1.3	m
27	0.6 + 0.8 = 1.4	2.3	1.3	m
28	0.6 + 0.8 = 1.4	2.3	1.3	m
29	0.6 + 0.7 = 1.3	2.2	1.2	m
30	0.6 + 0.7 = 1.3	2.2	1.2	m
31	0.6 + 0.7 = 1.3	2.2	1.2	m
32	0.6 + 0.7 = 1.3	2.2	1.2	m
33	0.6 + 0.7 = 1.3	2.2	1.2	m
34	0.6 + 0.7 = 1.3	2.2	1.2	m
35	0.5 + 0.7 = 1.2	2.0	1.4	m
36	0.5 + 0.7 = 1.2	2.0	1.4	m
37	0.4 + 0.7 = 1.1	1.8	1.8	sm
38	0.4 + 0.7 = 1.1	1.8	1.8	sm