

Huey-Kaew arboretum: running and stagnant water, April 4-6; — (5) Chulalongkorn University Campus, Bangkok: park ponds, May 11, 25; — (6) large pond near the Erawan Hotel, Bangkok, April 2.

The specimens, Feulgen slides, micrographs (1338) and films are in our private collection.

* *Protosticta* sp. (n.?) — Loc. 1; 1 spec.; 34 micrographs. — n=13.

Prodasineura autumnalis (Fraser) — Loc. 2; 1 spec. (venation slightly aberrant); 17 micrographs. — n=13, m.

* *Prodasineura* sp. (n.?) (1) — Loc. 2; 1 spec.; 33 micrographs. — n=13.

* *Prodasineura* sp. (n.?) (2) — Loc. 1; 1 spec.; 35 micrographs. — n=13.

Copera annulata (Sel.) — Loc. 4; 3 spec.; 34 micrographs. — n=13, m.

C. marginipes (Ramb.) — Loc. 1, 4; 2 spec.; 34 micrographs. — n=13, m. No *m*-pair was reported from India (cf. B.K. TYAGI, 1982, *Indian Rev. Life Sci.* 2: 149-161).

Agriocnemis f. femina (Br.) — Loc. 4; 2 spec.; 33 micrographs. — n=14, m.

A. pygmaea (Ramb.) — Loc. 5; 3 spec.; 40 micrographs. — n=14, m.

* *Cercion l. latericum* Lieft. — Loc. 5; 5 spec.; 64 micrographs. — n=14, m.

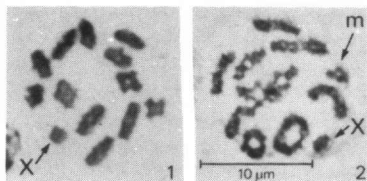
Ischnura senegalensis (Ramb.) — Loc. 5; 6 spec.; 71 micrographs. — n=14. No *m* in the Bangkok population. For a discussion on the occurrence of an *m*-bivalent in this species cf. B. KIAUTA & M.A.J.E. KIAUTA, 1980, *Odonatologica* 9: 237-245.

* *Onychargia atrociana* Sel. — Loc. 5; 1 spec.; 34 micrographs. — n=13 (Fig. 1). The low chromosome number is highly unusual for a member of the family. It is in agreement, however, with the situation in some species of the allied New World genus *Argia* (cf. B. KIAUTA & M.A.J.E. KIAUTA, 1980, *Odonatologica* 9: 35-56). According to a personal communication from Dr B.K. Tyagi, Ukai, Gujarat (April 23, 1980), the same chromosome number was found by him in the Agra (India) population of this species. Dr Tyagi expressed the opinion the Agra karyotype is characterized by the presence of an *m*-pair, which is definitely lacking in the Thai (Bangkok) material. Unfortunately, the available Indian photographic evidence is inconclusive, and the original Agra habitat has been

THE CHROMOSOME NUMBERS OF SOME ODONATA FROM THAILAND

On May 29, 1983, the well-known Thai entomologist, Bro. Amnuay Pinratana (Bangkok), informed us of his current work on a checklist of the Odonata of Thailand. In support of this valuable project we have prepared (June 27, 1983) a list of species examined cytologically during our two brief visits to that country, in early April and late May, 1979, and which includes a few cytologically highly interesting species. As often before, the specimens were kindly checked by Dr M.A. LIEFTINCK (Rhenen, The Netherlands), who informed us (December 21, 1980) that the material includes a number of probably undescribed taxa. Circumstances beyond our control prevent us for the time being to work out this material in detail. For the sake of record, therefore, we now present a preliminary list of male haploid chromosome numbers only. A full account will appear elsewhere at a later date. The 13 asterisked (*) species are new to cytology.

The locality data are as follows: (1) Pha-lad, Chiang Mai: a cascading stream, alt. 420 m approx., April 4-5; — (2) Huey-Kaew, Chiang Mai: a waterfall, alt. 320 m approx., April 4-6; — (3) Phai-Hin stream, Chiang Mai, alt. 320 m approx., April 4; — (4) near the west bridge of



Figs 1-2. Late male diakinesis: (1) Sel. (Bangkok), and (2) Ramb. (Chiang Mai; $n=12$, note the two ring bivalents). (Feulgen squash, 1500 X).

subsequently destroyed (Tyagi, pers. comm.; September 10, 1980).

* *Pseudagrion pruinatum* Burm. [ssp]. — Loc. 2; 2 spec.; 86 micrographs. — $n=14$, *m*. At Im, one bivalent very large, X similar to *m*.

* *P. r. rubriceps* Sel. — Loc. 4; 2 spec.; 23 micrographs. — $n=14$, *m*.

* *Libellago l. lineata* (Burm.) — Loc. 4; 2 spec.; 30 micrographs. — $n=14$.

* *Rhinocypha biseriata biforata* Sel. — Loc. 2; 4 spec.; 81 micrographs. — $n=12$, seldom 11 (?) or 13, *m*. At Im, bivalent distinctly large.

* *R. fenestrella* Ramb. — Loc. 1; 4 spec.; 62 micrographs. — $n=12, 13$, *m*. At Im, one bivalent large. Often increased chiasma frequency in $n=12$ and $n=13$ sets (Fig. 2).

* *Euphaea guerini* Ramb. — Loc. 1; 3 spec.; 40 micrographs. — $n=13$.

* *Neurobasis c. chinensis* (L.) — Loc. 2; 2 spec.; 34 micrographs. — $n=12$. Precocious segregation of one element not seldom.

* *Vestalis g. gracilis* (Ramb.) — Loc. 3; 4 spec.; 46 micrographs. — $n=13$, *m*.

* *Paragomphus capricornis* (Först.) — Loc. 4; 1 spec.; 34 micrographs. — $n=12$, no *m*. At Im, X second largest, one bivalent very large (Fig. 3).

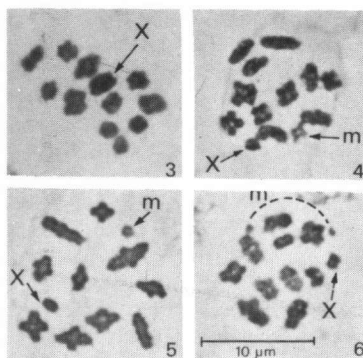
* *Acisoma p. panorpoides* Ramb. — Loc. 5; 1 spec.; 44 micrographs. — $n=13$, *m* (at Im, minute).

* *Brachydiplax c. chalybea* Br. — Loc. 5; 4 spec.; 57 micrographs. — $n=13$, *m*.

* *B. farinosa* Krüger — Loc. 4; 1 spec.; 21 micrographs. — $n=13$.

* *Brachythemis contaminata* (Fab.) — Loc. 5; 6; 8 spec.; 105 micrographs. — $n=13$, *m*.

* *Crocothemis servilia* (Dru.) — Loc. 2, 3, 5, 6; 4 spec.; 119 micrographs. — $n=13$, *m*, XO. At Im, precocious segregation of *m* in some figures.



Figs 3-6. Early primary spermatocyte metaphase: (3) Först. (Chiang Mai; note the large sex element); — (4) Dru. (Chiang Mai); — (5-6) Laidl. (Chiang Mai; note the precociously segregated *m*-bivalent in Fig. 6). (Feulgen squash, 1500 X).

* *Neurothemis t. tullia* (Dru.) — Loc. 4, 5; 4 spec.; 67 micrographs. — $n=13$, *m*. At variance with the Indian material (for references cf. TYAGI, as above), the karyotype of the Thai populations is of the usual libellulid type, with normal XO sex determination (Fig. 4).

* *Tholymis tillarga* (Fabr.) — Loc. 1; 1 spec.; 33 micrographs. — $n=13$, *m* (at Im, minute).

* *Zygonyx iris malayana* (Laidl.) — Loc. 1; 3; 3 spec.; 61 micrographs. — $n=12$, *m*. In some 50% of Im figures of one of the specimens, the *m* segregates precociously (Figs 5-6).

For the hospitality during our stay in Chiang Mai and for the assistance in the laboratory we warmly thank Dr and Mrs M. TITAYAVAN (Dept Ent., Fac. Agric., Chiang Mai Univ.). Mr S. CHAIWAN and Mr A. WONGCHAI were helpful in the field. Dr Titayavan checked the manuscript of this note prior to its publication.

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