

DESCRIPTIONS OF THREE NEW TAXA IN THE GENUS *DAVIDIUS* SELYS FROM SHAANXI, CHINA (ANISOPTERA: GOMPHIDAE)

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D. miaotaiziensis sp. n. (holotype ♂: China, Shaanxi: Miaotaizi, 12-VI-1986; allotype ♀: same locality, 13-VI-1987), *D. yuanbaensis* sp. n. (holotype ♂: China, Shaanxi: Yuanba, VI-1983), and *D. davidi shaanxiensis* ssp. n. (holotype ♂: China, Shaanxi: Miaotaizi, IX-1984; allotype ♀: same locality, 15-VI-1987) are described and figured. The latter is similar to *D. d. assamensis* Laidlaw, from which it differs by the unmarked 3 distal abdominal segments and by the sternal processes on segments 7-9. — The types are deposited in the Department of Biology, Hanzhong Teachers College.

INTRODUCTION

Since 1981, the second and the third authors are engaged in the study of the odonate fauna of the southern Shaanxi. The present paper is based on the rich collections gathered.

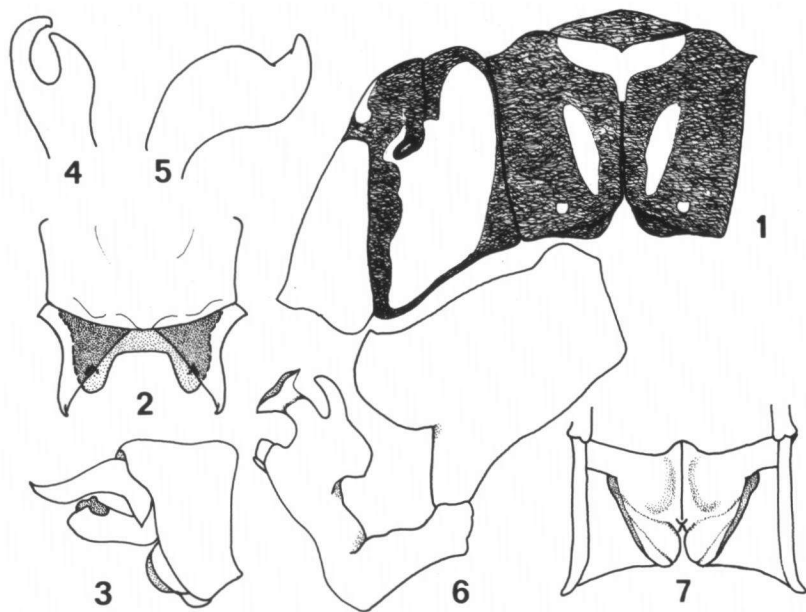
The type specimens are deposited in the Department of Biology, Hanzhong Teachers College, Hanzhong, Shaanxi, China.

DAVIDIUS MIAOTAIZIENSIS SPEC. NOV.

Figures 1-7

Material examined. — **Holotype** ♂: China, Shaanxi, Miaotaizi, 12-VI-1986. — **Allotype** ♀: same locality, 13-VI-1987. — **Paratype** ♂: same locality, 5-VI-1987. — 2 ♂: Shaanxi, Yuanba, 25-VI-1985, one of which has no cross vein in discoidal cell of hind wing.

MALE. — Total length 45 mm, abdominal length 32 mm, hind wing length 27.5 mm.



Figs 1-7. *Davidius miaotaiziensis* sp. n. (Figs 1-6: ♂; Fig. 7: ♀); (1) Pterothorax; — (2) Anal appendages, dorsal view; — (3) Same, left view; — (4) Anterior hamule left view; — (5) Posterior hamule, left view; — (6) Penis, left view; — (7) Vulvar scale, ventral view.

Colors. — Black, the pale parts of head, thorax and abdomen are yellow.

Head. — Labrum with on the front a transverse stripe and bordered with black at ventral margin anteclypeus dirty yellow; antefrons yellow and overlapping the front of epifrons, and hind part of occiput yellow.

Prothorax. — Fore-area and sides of hind lobe yellow.

Pterothorax (Fig. 1). — A complete mesothorax collar stripe confluent with a shorter median dorsal stripe; the antehumeral stripe slightly converging above; isolated upper humeral spots present and laterally two broad yellow stripes separated by a narrow black stripe on the postero-lateral suture.

Abdomen. — Dorsum and sides of segment 1, auricula and baso-lateral spot of segment 2, a small triangular baso-dorsal spot and baso-lateral spot of segment 3, a narrow basal ring of 4 to 6, three basal spots of segment 7, and each distal margin of 7 and 8, yellow; remaining segments and anal appendages unmarked.

Anal appendages (Figs 2, 3). — The superiors about as long as segment 10, slightly diverging backwards, each ending in a curved upward tip, and bearing an outer tooth basally; the inferior shorter, round apices broadly separated and with a small dorsal process on each side.

Genitalia of second segment (Figs 4-6). — Anterior hamule divaricated, its fore branch slightly longer and recurved toward the hind one; posterior hamule robuster and ending in a backwardly curved tooth; penis small, apex of its post-lobe blunt and longer than the rounded scale lobe.

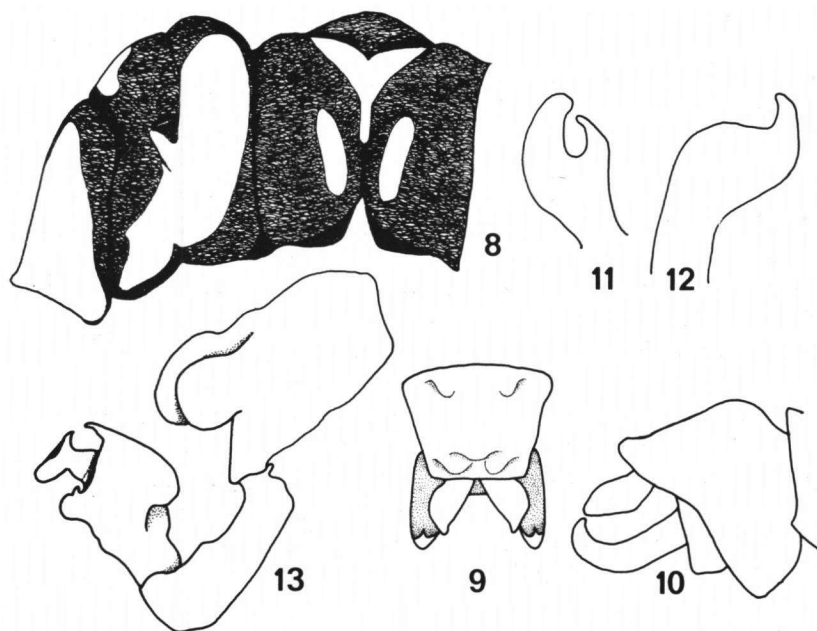
FEMALE. — Total length 42 mm, abdominal length 30.6 mm, hind wing length 29 mm; coloration similar to the male, but the yellow marking of abdomen more extensive as follows: pale area on sides of segment 2 confluent; baso-lateral spots on 3 to 6 broader and marked with a longitudinal lateral spot; on 7 only baso-lateral spot present, and it is very small on 8; the vulvar scale cordiform, as long as the sternite and slightly bifid at apex (Fig. 7).

DAVIDIUS YUANBAENSIS SPEC. NOV.

Figures 8-13

Material examined. — **Holotype** ♂: China: Shaanxi, Yuanba, VI-1983; — **Paratypes** (3 ♂): same locality and date, one has no cross vein in discoidal cell of hind wing.

MALE. — Total length 45 mm, abdominal length 33 mm, hind wing length 27 mm.



Figs 8-13. *Davidius yuanbaensis* sp. n. (♂): (8) Pterothorax; — (9) Anal appendages, dorsal view; — (10) Same, left view; — (11) Anterior hamule, left view; — (12) Posterior hamule, left view; — (13) Penis, left view.

Colors. — Black, the pale parts of head, thorax and abdomen are yellow.

Head. — Labrum has a transverse stripe on front, bordered with black at ventral margin; anteclypeus dirty; the yellow postclypeus bordered with black at ventral margin; antefrons and occiput unmarked.

Prothorax. — Fore area and a pair of twin spots on median area, yellow.

Pterothorax (Fig. 8). — A complete mesothoracic collar stripe confluent with a shorter median dorsal stripe; the antehumeral stripe slightly converging above and laterally two very broad stripes separated by a broader black stripe on the postero-lateral suture.

Abdomen. — Dorsum and sides of segment 1, a dorsal stripe, auricula and baso-lateral spot of segment 2, and baso-lateral spot and lateral spot of 3 to 4, yellow; smaller baso-lateral spots present on 5 to 7 which are becoming progressively smaller from 5 to 7; each distal margin of 6 to 9 yellow; remaining segments and anal appendages unmarked.

Anal appendages (Figs 9, 10). — The simple superiors slightly diverging backwards, and the inferiors each ending in a upturned recurved apex.

Genitalia of second segment (Figs 11-13). — Similar to those of *D. miaotai-ziensis*, but fore-branch of anterior hamule broader and the posterior lobe of penis tapering into a prominent tip.

DAVIDIUS DAVIDI SHAANXIENSIS SSPEC. NOV.

Figures 14-22

Material examined. — **Holotype** ♂: China: Shaanxi, Miaotai, IX-1984; — **Allotype** ♀: same locality, 15-VI-1987.

MALE. — Total length 44 mm, abdominal length 34 mm, hind wing length 29 mm.

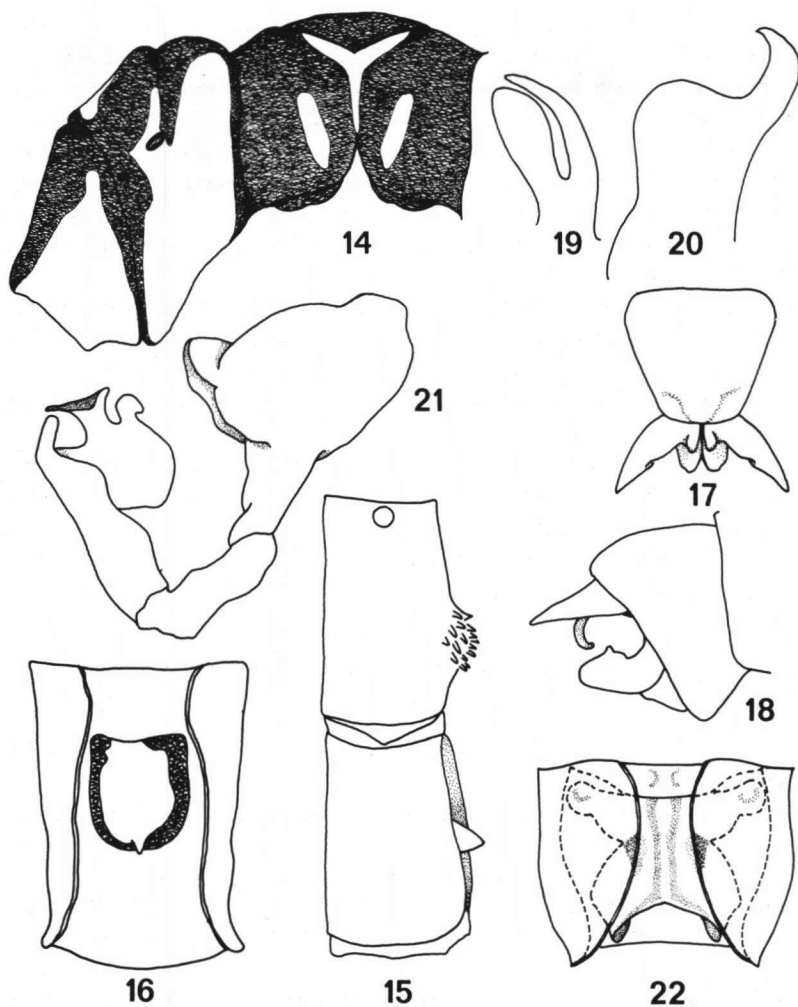
Colors. — Black, the pale parts of head, thorax and abdomen are yellow.

Head. — Labrum unmarked; anteclypeus dirty; antefrons yellow and bordered with black at ventral margin; occiput yellow spot extending to its hind part.

Prothorax. — Front and hind lobe yellow and all bordered with black margin.

Pterothorax (Fig. 14). — A complete mesothoracic collar stripe confluent with a median dorsal stripe: the antehumeral stripes are converging above: lateral side broadly yellow and separated by a black stripe on the postero-lateral suture.

Abdomen. — Dorsal and lateral spots of segment 1, dorsal stripe, auricula and baso-lateral spot of segment 2, baso-lateral and lateral spots of segment 3, yellow; baso-lateral spots progressively smaller from 4 to 7, and each distal margin of 6 to 9, yellow; ventrally segments 7 to 9 are provided with a process (Figs 15, 16), on 7 a tubercle present on the sternite which is covered with 7 to 10 backwardly directed blunt spines, segment 8 with a process about half way (cf.



Figs 14-22. *Davidius davidi shaanxiensis* ssp. n. (Figs 14-21: ♂; Fig. 29: ♀): (14) Pterothorax; — (15) Abdominal segments 7 and 8, right view; — (16) Abdominal segment 9, ventral view; — (17) Anal appendages, dorsal view; — (18) Same, left view; — (19) Anterior hamule, left view; — (20) Posterior hamule, left view; — (21) Penis, left view; — (22) Vulvar scale, ventral view.

Fig. 15), and segment 9 with a margined irregular yellow swelling and ending in a little tooth.

Anal appendages (Figs 17, 18). — Shorter than segment 10; superiors forked, the outer branches strongly divergent and sharply pointed, the inner branches smaller and inclined downward and recurved slightly; inferior shorter,

rounded with a nipple-like process above.

Genitalia of second segment (Figs 19-21). — Anterior hamule deeply forked, both branches are equal in length but the fore one robust; posterior hamule robust and tapering; the penis small, scale lobe slightly longer than post-lobe and both recurved backward.

FEMALE. — Total length 42 mm, abdominal length 32 mm, hind wing length 29 mm; coloration similar to the male, but yellow markings of abdomen more extensive as follows: yellow area on segment 2 confluent; a longitudinal baso-lateral linear spot which is extending to the jugal suture on 3 to 7, the lateral spot progressively smaller from 3 to 7; the baso-lateral spot of segment 8 very obscure; the vulvar scale (Fig. 22) strongly notched and almost as long as the sternite of segment 9.

Remark. — The new subspecies is easily distinguished from *D. davidi assamensis* Laidlaw by the three unmarked distal abdominal segments and by the sternal processes on 7 to 9, which are different from each other.

REFERENCES

- CHAO, H.-f., 1954. Classification of Chinese dragonflies of the family Gomphidae (Odonata). III. *Acta ent. sin.* 4(3): 213-275.
- FRASER, F.C., 1934. *The fauna of British India, including Ceylon and Burma, Odonata*, Vol. 2. Taylor & Francis, London.
- HAMADA, K. & K. INOUE, 1985. *The dragonflies of Japan in colour*. Vols 1 & 2. Kodansha, Tokyo.
- NEEDHAM, J.G., 1930. A manual of the dragonflies of China. *Zool. sin.* (A) 11(1), 344+11 pp., 20 pls excl.