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ON THE MALE OF *LIPHISTIUS TRANG* (ARANEAE: MESOTHELAE), WITH NOTES ON THE NATURAL HISTORY OF THE SPECIES

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ABSTRACT

The male of the spider *Liphistius trang* PLATNICK and SEDGWICK is described from specimens taken near the type locality and reared in captivity. Notes are given on the peculiar burrow and the life history of the species.

INTRODUCTION

Liphistiids hold an outstanding position within the true spiders. Distinguished by retaining several primitive characters, such as a segmented abdomen and a full set of 8 spinnerets in a central position on the venter, they stand far apart from all other spiders and may with good reason be called living fossils (BRISTOWE 1975b). The recent revision of the genus *Liphistius* by PLATNICK & SEDGWICK (1984) lists only 14 species, restricted in their distribution to Burma, Thailand, peninsular Malaysia and Sumatra. Two species are recorded from Thailand: *L. bristowei* PLATNICK and SEDGWICK (misidentified as *L. birmanicus* by BRISTOWE (1975a)) from Doi Suthep, Chiang Mai, and *L. trang* PLATNICK and SEDGWICK from Krachong Forest, Trang. The latter species was hitherto known only from females. In August 1986 4 penultimate males were collected at Khao Chong Nature Education Center, Khao Banthat Wildlife Sanctuary, near Trang, and reared in captivity. They subsequently matured in November 1986 and in February 1987.

Liphistius trang PLATNICK and SEDGWICK, 1984

Figures 1–6

Type: The female holotype from Krachong Forest near Trang, deposited in the California Academy of Sciences, San Francisco, is described by PLATNICK & SEDGWICK (1984): 13, 14, Figs. 20, 21.

Male: The format of the present description follows that of PLATNICK & SEDGWICK (1984); sizes mentioned are in mm. Male similar to female except for the following.

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Total length, not including chelicerae 10.9. Carapace 6.2 long, 5.6 wide, orange in colour, the dark brown triangular patches laterally on coxal elevations more distinct than in the female, reaching the margin of the carapace. Ocular tubercle 0.95 long, 1.05 wide. Eye sizes and interdistances: AME* 0.10, ALE* 0.55, PME* 0.38, PLE* 0.53; AME – AME 0.10, AME – ALE 0.10, PME – PME 0.05, PME – PLE 0.10, ALE – PLE 0.13. Median eye quadrangle 0.55 long, front width 0.30, back width 0.68. Sternum 4.0 long, 1.0 wide. Labium 0.5 long, 0.8 wide. Endites 2.8 long, 1.4 wide. Promargins of chelicerae with 9 teeth. Tibiae of legs with dark brown annulations almost connected, separated only by a small pallid ring; distal segments entirely darkened. Superior tarsal claws mostly with 3 teeth (1/3 on the pro-/retroclaw of the right leg IV, 2/4 on the left); inferior claw with one denticle on legs I – III and with 2/none on left/right leg IV. Legs:

	I	II	III	IV	Palp
Femur	5.1	5.3	5.4	6.5	3.9
Patella	2.5	2.5	2.5	2.7	2.0
Tibia	3.9	4.1	4.4	5.9	3.8
Metatarsus	4.3	5.0	6.0	8.3	—
Tarsus	2.2	2.3	2.5	3.3	1.9
Total	18.0	19.2	20.8	26.7	11.6

Abdomen 5.1 long, 3.4 wide, tergites with brown spots on lateral margins and in 2 rows along the middle. The palp (Figure 1) most closely resembles that of *L. murphyorum,* particularly in the shape of the embolus, which is deeply notched and divided into a detached sprout-shaped hyaloid lamella and a strongly sclerotized part, strengthened by 3 ridges and apically lobulate, within which lies the spermophore. The proximal edge of the embolus similarly projects retroventrally into a scale-like thin plate. However *L. trang* can be distinguished by the presence of an alveolar apophysis, by a distinct process ventrally on the tegulum and by strong longitudinal ridges at the base of the embolus. An elevated cumulus and a subtegular apophysis are both absent (cf. HAUPT, 1983: 279, 280, Fig. 3 and PLATNICK & SEDGWICK, 1984: 16 – 18, figs. 38 – 42). Terminology according to HAUPT (1983).

Variation

The three male specimens available for study differ only slightly in body measurements, the dentation of the claws is fairly variable. Penultimate males show the coloration of fully grown females and gain distally darkened legs in their final moult. Such males can easily be distinguished from females of the same size by their swollen

* AME, ALE, PME, PLE, anterior (posterior) median (lateral) eyes.

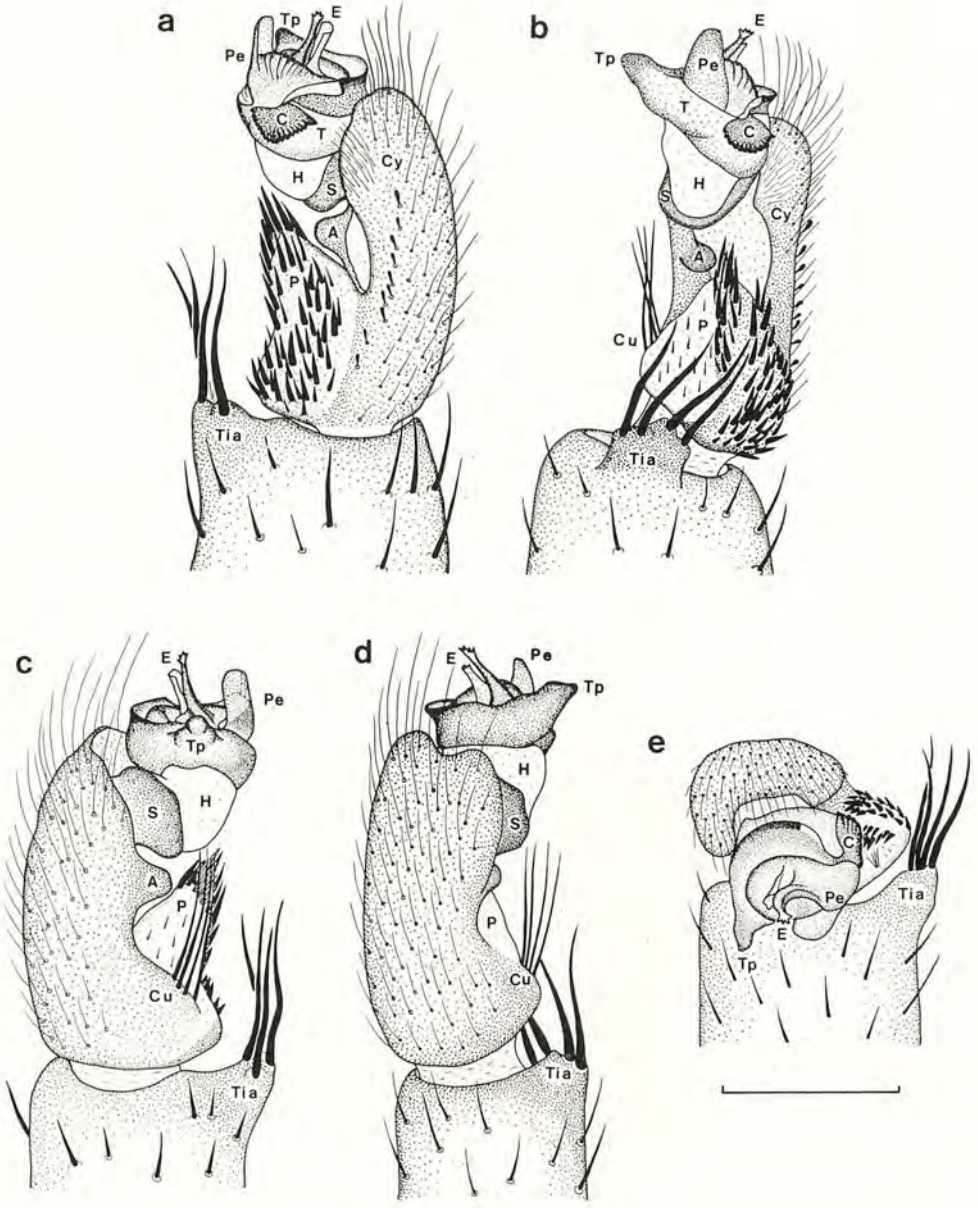

Figure 1. *Liphistius trang* PLATNICK and SEDGWICK, reflection of the right palp. a, retrolateral; b, retroventral; c, ventral; d, prolateral; and e, distal view. Scale line, 1 mm. A, alveolar apophysis; C, contrategulum; Cu, cumulus; Cy, cymbium; E, embolus; H, hematodocha; P, paracymbium; Pe, proximal edge of embolus; T, tegulum; Tia, tibial apophysis; Tp, tegular process; S, subtegulum.

palpal tarsi: the tarsal width of the female being 8, whereas in the penultimate male it is 12 (tibial width 13 mm in both of them).

Material examined

Four penultimate males, collected at Khao Chong Nature Center (150 m above sea level) on August 15, 1986, matured on November 25, 1986 (killed January 10, 1987); on November 30, 1986 (died in the final moult, thus not suitable for study); on February 3, 1987 (killed April 16, 1987); and on February 21, 1987 (died soon after moulting). Three adult females, taken with the males, moulted on August 26, 1986 and on March 11, 1987 (died October 16, 1987); on February 2, 1987 and on September 5, 1987 (died October 10, 1987); and on December 9, 1986 (died in June 1987). All specimens will be deposited in a public collection.

Distribution

Known only from Trang Province, southern Thailand.

NATURAL HISTORY

Habitat. Burrows of *L. trang* can be found in fair numbers on temporarily shaded, steeply inclined roadsides and earth banks covered with sparse vegetation, mostly facing east to south. Apparently the spiders prefer soil which is penetrated by tree roots. The signal threads radiating from the burrow entrance are often found stretched out over the surface of such roots.

Domicile. *L. trang* builds a characteristic, almost T-shaped burrow (Figure 2) with two entrances, which are closed by trap doors. The front entrance is equipped with 6 to 8 signal threads, up to 20 cm long. Its door is of a larger size than the back door. An atrium, more or less strongly bent, 1.8 cm deep and up to 7 cm long, covered by a ceiling of interwoven soil particles and well camouflaged to the outside, extends just below the soil surface and interconnects both entrances. Half way between the entrances, the main tube runs back from the atrium and penetrates up to 20 cm more or less horizontally into the slope. Burrows of very young spiders usually lack that tube. In two cases spiders were extracted from a 2-cm long side shaft, branching at right angles from the lower portion of the main tube. An empty egg sac of 1.6 cm in diameter and 1.0 cm high was found stored below the floor of one tube, 4 cm from the bottom.

Behaviour. At night the spiders can be found in ambush behind the front door, their anterior legs and palps resting on the entrance rim and on the signal threads, in order to perceive vibrations caused by approaching prey (BRISTOWE 1952, 1975b, 1976; KLINGEL 1967; MURPHY & PLATNICK 1981; COYLE 1986). When disturbed, the spiders retreat into the main tube. They were never observed to escape through the back door.

Annual cycle. It is difficult to recognize the mating period, as maturation of

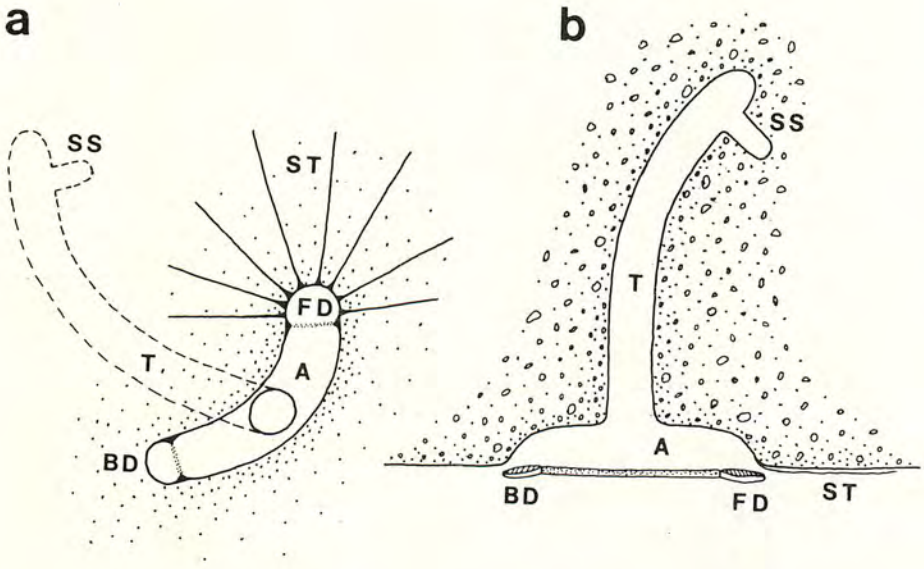

Figure 2. Burrow of *Liphistius trang:* a, seen from outside, subterranean portion dotted; b, horizontal section seen from above. A, atrium; BD, back door; FD, front door; SS, side shaft; ST, signal threads; T, main tube.

Figure 3. Female of *Liphistius trang* capturing a grasshopper. The spider is only half emerged from the burrow, the posterior part of her body remaining under the trap-door. Picture taken in captivity.

Figure 4. Burrow of *Liphistius trang* on a roadside at Khao Chong, Trang Province.
Figure 5. Sac-like burrow of juvenile spider built on plain rock at Khao Chong, Trang Province.
Figure 6. *Liphistius trang*: male (left) and female (right).

males was observed at distinctly separated dates (November 25, 30 and February 3, 21). Neither of the two surviving specimens showed any attempt to mate in captivity, but they were instead killed by the females. Males of two new *Liphistius* species from southern Thailand (SCHWENDINGER in preparation) matured from late January to late February; hence males of *L. trang* maturing in February is more likely to be in accordance with natural conditions. The early attainment of maturity in November was probably caused by conditions of captivity. The discovery of an empty egg sac on August 15 indicates that the offspring dispersed some time before that date. This suggests that mating, egg laying and breeding take place roughly between February and August. The data indicate that adult females moult twice a year, before and after the reproductive period.

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