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SHORT COMMUNICATION

POST-MATURATION MOLT FOUND IN A WOLF SPIDER, *PARDOSA ASTRIGERA* (ARANEAE, LYCOSIDAE)

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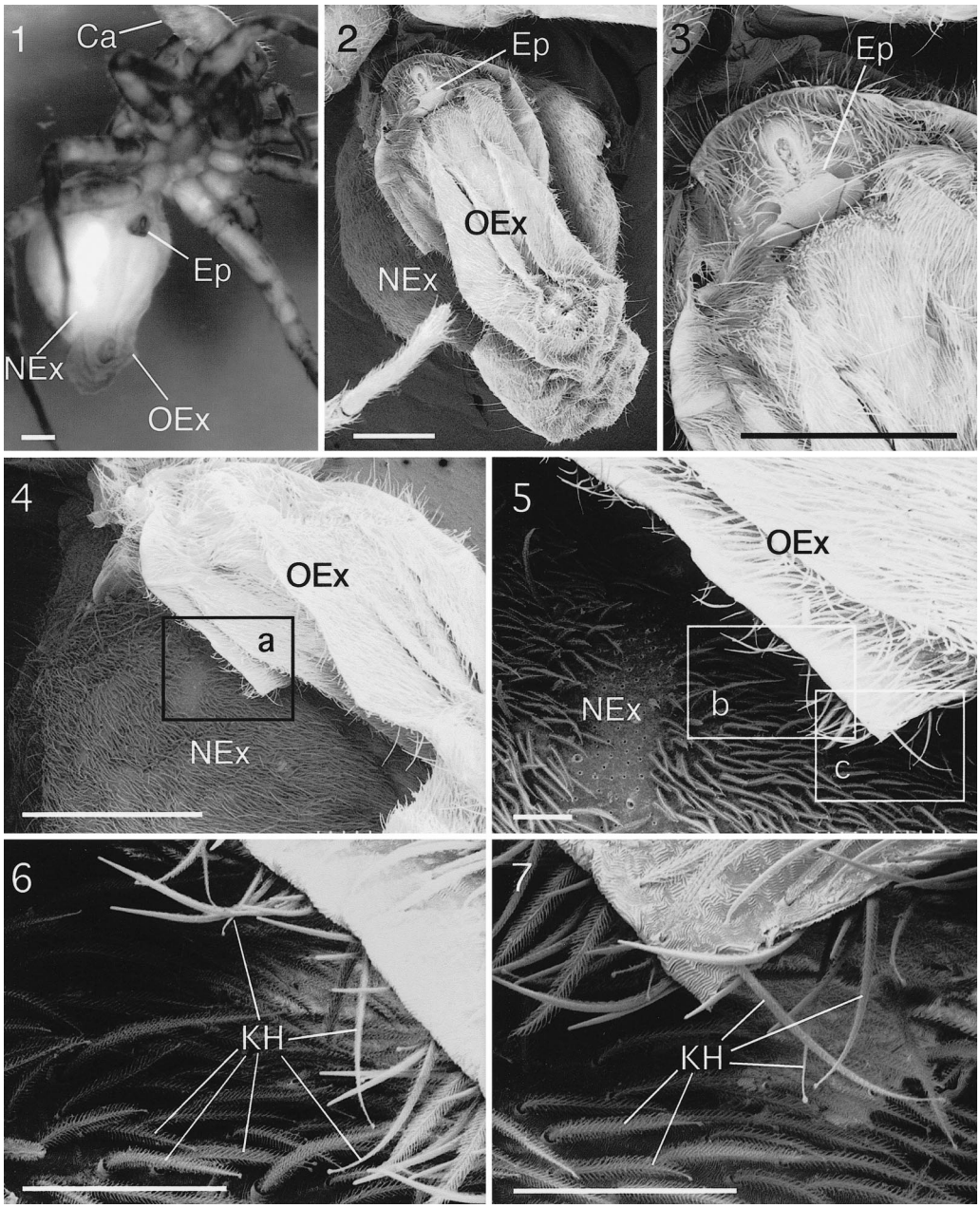
ABSTRACT. An adult female *Pardosa astrigera* (Araneae, Lycosidae) died failing to finish an additional molt in the laboratory. Its maturity was morphologically ascertained by SEM examination.

Keywords: Lycosidae, *Pardosa astrigera*, post-maturation molt

Post-maturation molt is well known in females of the primitive spiders (Liphistiomorphae and Mygalomorphae) which continue to grow for several years after sexual maturation (Baerg & Peck 1970; Main 1976; Stradling 1978; Stewart & Martin 1982; Yoshikura 1987; Maki 1989; Miyashita 1992). Post-maturation molt, however, is very rare among entelegynes and has been reported only for six females in three species: three in *Latrodectus mactans* (Fabricius 1775) (Theridiidae) (Kaston 1968), two in *L. hesperus* Chamberlin & Ivie 1935 (Kaston 1968), and one in *Heteropoda venatoria* (L. 1758) (Sparassidae) (Kayashima 1981). This report documents one more entelegyne post-maturation molt found in a female wolf spider (Lycosidae), *Pardosa astrigera* L. Koch 1878. This female was captured on 11 June 1983 at Hidaka, in northwestern Kanto Plain, central Japan. It molted to maturity on 30 June, and died on 3 August of that year, after failing to extract its extremities during the additional molt. It was then preserved in 70% ethanol. *Pardosa astrigera* is common on the sunny ground with sparse vegetation (Fujii 1998) and is found also in Korea and China (Tanaka 1993). Its ecophysiological characteristics were heavily studied (Miyashita 1968a, 1968b, 1969a, 1969b, 1998; Fujii 1974, 1978, 1980; Tanaka & Itô 1982), though this spider had been identified with a closely related species, *Pardosa (Lycosa) T-insignita* until the examination by Tanaka (1980).

Sclerification and lengthening of epigyna in females of *Schizocosa ocreata* (Hentz 1844) (Lycosidae) begin by the third or fourth instar prior to maturation (Amaya & Klawinski 1996). Thus, one may sometimes confuse an immature female with a mature one when observing it with a magnifying glass or the naked eye. The females reported by Kaston (1968) and Kayashima (1981) had undoubtedly matured because they copulated and laid fertile eggs before the additional molt. On the other hand, this *P. astrigera* female refused the courtship of a male and killed it. This female left no evidence of egg-cocoon construction, which sometimes occurs even in virgin females. Its maturity was ascertained by the morphological observations described below.

In many lycosid species, knob-tipped hairs (knobbed hairs) peculiar to adult female abdomens were found (Graefe 1964; Rovner et al. 1973). Also in *P. astrigera*, I found the hairs on adult females (Fujii 1983), but not on subadult females nor on males. If the *P. astrigera* female actually had matured before the final molt, a well-developed epigynum (with genital openings) and knobbed hairs should be found on the old (molted) exuvium of its abdomen. The specimen was observed with a digital optical microscope (Keyence VH-Z05) (Fig. 1), then was examined with a scanning electron microscope (Hitachi S-4000) after critical point drying and ion-beam sputter coating with Pt-Pd (Figs. 2–7). A well-developed epigynum was seen in the area of old exuvium (Figs. 1–3), and its external features coincided with those of the standard epigynum illustrated in Tanaka (1980, 1993). Many knobbed hairs were also detected on both old and new exuviae (Figs. 6, 7). From these re-



Figures 1–7.—A female of *Pardosa astrigera* that died at an additional molt after maturation. 1. The female in 70% ethanol before treatments for electron microscopic observation; 2–7. Scanning electron micrographs of the ventral side of the abdomen. 2. The whole abdomen; 3. The epigynum on the old exuvium; 4, 5. The old and new exuviae in the mid-dexter portion (5 corresponds to 4a); 6, 7. Knobbed hairs both on the old and new exuviae (6 and 7 correspond to 5b and 5c, respectively). *Abbreviations:* Ca = carapace, Ep = epigynum, KH = knobbed hairs, NEx = new exuvium, OEx = old exuvium. *Scale bars:* Figures 1–4 = 1 mm, Figures 5–7 = 0.1 mm.

sults it can be said that post-maturation molt occurred in this lycosid. Renewal of the epigynum at this molt could not be seen in this specimen as well as in the Kaston's females. This specimen was deposited as the voucher in the collection of the Department of Zoology, National Science Museum, Tokyo (NSMT-Ar 4321).

If the post-maturation molt of entelegynes were part of a reproductive strategy, it would be expected to occur only in extremely old or small females. But the female of *P. astrigera* molted only 34 days after maturation, while females of this species usually live for a longer period (143 days is the longest known). Moreover, its carapace width reached to 3.2 mm at maturity. This size is not small compared to the range of 2.2–3.5 mm in adult females of *P. astrigera* collected in the field (Fujii unpubl. data). This additional molt could not be found in the other 368 females of 18 lycosid species (50 females of *P. astrigera*), which had matured in the field (216 females) or the laboratory (152 females) from 1981–1987 and were reared until the death to examine their life cycles. This molt may be an accidental phenomenon occurring at very low frequency (0.27% for the total lycosids) and seems to occur also in natural lycosid populations.

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