NATURE IN SINGAPORE 2011 **4**: 85–90
Date of Publication: 4 May 2011

RECORDS OF THE BLACK-FACED CONEHEAD KATYDID, *PERACCA SUBULICERCA* (KARNY, 1926) IN SINGAPORE, WITH AN ACCOUNT OF PREDATION ON A FOREST SNAIL (ORTHOPTERA: TETTIGONIIDAE: CONOCEPHALINAE: AGRAECIINI)

Tzi Ming Leong
Department of Biological Sciences, National University of Singapore
14 Science Drive 4, Singapore 117543, Republic of Singapore
(*E-mail: dbsleong@nus.edu.sg, banjarana@gmail.com*)

INTRODUCTION

The katydid genus *Peracca* Griffini, 1897 belongs to the tribe Agraeciini within the subfamily Conocephalinae and is represented by six species found within Sundaland—Sumatra, Java, Peninsular Malaysia, and Borneo (Ingrisch, 1998). In *Peracca*, the wings are drastically reduced, with the males being regarded as micropterous, and females squamipterous (Ingrisch, 1998). In Singapore, *Peracca subulicerca* (Karny, 1926) occurs within forested areas of the Central Catchment and Bukit Timah Nature Reserves. Elsewhere, the species has been recorded from Java and Sumatra (Ingrisch, 1998). Adults and juveniles of this species have been sporadically encountered in the field while conducting nocturnal faunal surveys, and representative voucher specimens exist within the entomological collections of the Zoological Reference Collection (ZRC) of the Raffles Museum of Biodiversity Research (RMBR), National University of Singapore (see: Material Examined). The proposed vernacular name of 'black-faced conehead katydid' alludes to the prominent black colour of its frons and the conical apex of its head (Fig. 1). Here, adult males and females are illustrated, accompanied by natural history notes that include a female feeding on a juvenile forest snail at the Bukit Timah Nature Reserve.

Fig. 1. Anterior view of adult female *Peracca subulicerca* (body length ca. 30 mm) encountered along the MacRitchie Nature Trail on the night of 8 Aug.2009 (ca. 2130 hours). It was perched on forest vegetation at shoulder level. Note black frons and conical apex of head.

OBSERVATIONS

Consistent with the known activity period of this tribe, *Peracca subulicerca* is a katydid encountered only at night. They are brownish, medium-sized katydids (body lengths: 24–36 mm), with no pronounced sexual dimorphism, except for the different shape or structure of their cerci and the presence of a sword-like ovipositor in the female (absent in males). The species is predominantly arboreal and has been found perched on trail-side vegetation from knee- to eye-level.

Careful examination of the female cerci reveals that the tip is drawn out to a relatively long, straight apical area (Fig. 2), agreeing with that illustrated for the species (Ingrisch, 1998: 285, Fig. 75R). In addition, the cerci are also adorned with short, fine hairs. In males, the cerci morphology is more elaborate (Figs. 3, 4) and details concur with prior descriptions and illustrations (Ingrisch, 1998: 94, 283, Figs. 74L, M−O). The male cercus is characterised by a bulbous base and bears a sinuate, compressed baso-internal process directed inwards. This process gradually tapers to an acute apex. The posterior length of the cercus is narrow and sinuate, with a dorsal ridge of minute denticles (caramel-coloured) along the apical margin. The terminal portion consists of a thin, curved apical spine. In addition, examination of the ventral aspects of male specimens provided further agreement with published illustrations of its mesosternum and metasternum (Ingrisch, 1998: 285, Fig. 75W, AB).

In the field, encounters with *Peracca subulicerca* were often of single individuals. However, on the night of 16 Mar.2009 (ca. 2345 hours), a pair of adults was sighted at Bukit Timah Nature Reserve (Fig. 5). They were perched on a leaf, facing each other, with the tips of their heads ca. 30 mm apart. Their antennae were clearly in mutual contact and gently stroking each other, possibly a form of courtship or assessment of the receptiveness to mating.

Also at the Bukit Timah Nature Reserve, a female *Peracca subulicerca* was found to be in the initial stages of feeding on a forest snail, on the night of 26 Sep.2009 at ca. 2050hours (Figs. 6, 7). The katydid was on a leaf of a shrub at knee-level and had subdued the snail with its limbs. Upon closer inspection, the chewing movements of the large, black mandibles could be seen from the left side (Fig. 8). Photography of this predation event was carefully limited to minimise disturbance to the katydid.

Upon return to the scene at 2250 hours, the katydid was no longer in sight. Nevertheless, the remnant shell of the snail was found and recovered nearby, ca. 10 cm from original site (Fig. 9). A vast majority of its body had been consumed, with only sparse remains of its internal organs. This shell was collected, measured and deposited at the RMBR (ZRC.MOL.2901, shell diameter: 10 mm, shell depth: 5 mm). It was identified to be a juvenile *Quantula striata* (Gray, 1834) (family Ariophantidae) by Tan Siong Kiat (RMBR).

Fig. 2. Posterior close-up (dorsal view) of female to view details of cerci (2 mm long) and ovipositor (15 mm long). Encountered at Bukit Timah Nature Reserve on 17 Mar.2010.

Fig. 3. Adult male (body length ca. 33 mm) encountered at Bukit Timah Nature Reserve on 5 Jun.2010 (ca. 2135 hours).

Fig. 4. Posterior close-up (dorsal view) of male to view details of cerci (5 mm long). Encountered at Bukit Timah Nature Reserve on 14 Mar.2010.

Fig. 5. Antennal interaction between female (left, body length 32 mm) and male (right, body length 30 mm) katydids, observed at Bukit Timah Nature Reserve on 16 Mar.2009 (ca. 2345 hours).

Fig. 6. Lateral view (right side) of female katydid (body length ca. 33 mm) feeding on a snail. Encountered at Bukit Timah Nature Reserve on 26 Sep.2009 (ca. 2050 hours).

Fig. 7. Lateral view (left side) of female katydid (as in Fig. 6).

Fig. 8. Anterior close-up of female katydid (as in Figs. 6, 7). The black mandibles were employed in slicing and tearing off the snail's flesh.

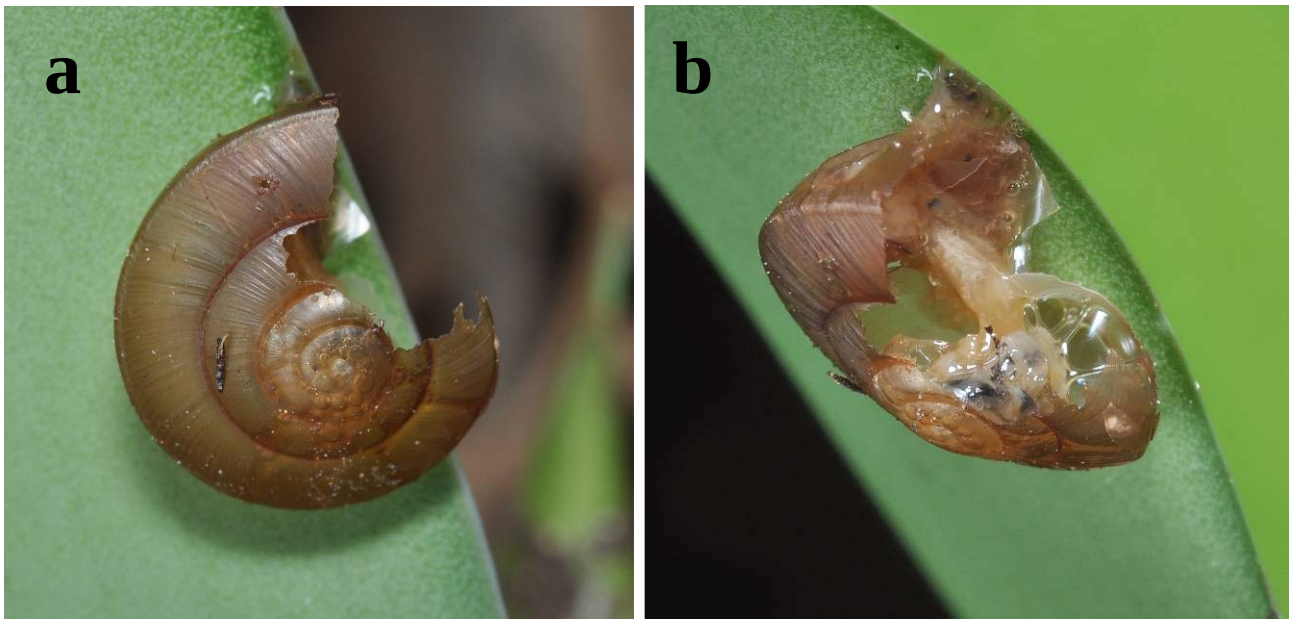

Fig. 9. Dorsal (a) and lateral (b) views of the remnant snail shell (ZRC.MOL.2901, shell diameter: 10 mm, shell depth: 5 mm). Note the fresh bite marks on the brittle shell. The snail was a juvenile *Quantula striata* (Ariophantidae).

On another occasion, a male *Peracca subulicerca* was photographed feeding on the whitish flesh of a forest fruit along the Petaling Trail (MacRitchie Reservoir forest) on 18 Sep.2009 at ca. 2135 hours (Fig. 10). Hence, both feeding accounts clearly reflect the omnivorous nature of this katydid, lending support to the reported diet of both plant and animal matter by members of the Agraeciini (Ingrisch, 1998). At present, other aspects of its natural history (e.g., stridulation, mating, oviposition) have not been documented and remain to be studied in subsequent field efforts.

Fig. 10. A male (body length 28 mm) feeding on an unidentified fleshy forest fruit along Petaling Trail (MacRitchie Reservoir forest) on 18 Sep.2009 (ca. 2135 hours).

MATERIAL EXAMINED

***Peracca subulicerca* (Karny, 1926)**
[BL = body length, PL = pronotum length, PF = postfemur length, OL = ovipositor length (females only), BTNR = Bukit Timah Nature Reserve]

ZRC.6.21707, female, BL: 36 mm, PL: 9 mm, PF: 20 mm, OL: 15 mm, coll. T. M. Leong, BTNR, 23 May 2009; ZRC.6.21708, female, BL: 27 mm, PL: 8 mm, PF: 19 mm, OL: 15 mm, coll. T. M. Leong, MacRitchie forest, 19 Dec.2009; ZRC.6.21759, female, BL: 28 mm, PL: 8 mm, PF: 19 mm, OL: 15 mm, coll. T. M. Leong, BTNR, 14 Mar.2010; ZRC.6.21760, male, BL: 29 mm, PL: 8 mm, PF: 19 mm, coll. T. M. Leong, BTNR, 14 Mar.2010; ZRC.6.21761, male, BL: 24 mm, PL: 9 mm, PF: 17 mm, coll. T. M. Leong, BTNR, 14 Mar.2010; ZRC.6.21762, female, BL: 29 mm, PL: 8 mm, PF: 19 mm, OL: 15 mm, coll. T. M. Leong, BTNR, 18 Mar.2010; ZRC.6.21763, male, BL: 26 mm, PL: 8 mm, PF: 17 mm, coll. T. M. Leong, BTNR, 18 Mar.2010; ZRC.6.21801a, female, BL: 30 mm, PL: 8 mm, PF: 20 mm, OL: 16 mm, coll. T. M. Leong, BTNR, 10 Apr.2010; ZRC.6.21801b, female, BL: 28 mm, PL: 8 mm, PF: 20 mm, OL: 15 mm, coll. T. M. Leong, BTNR, 10 Apr.2010; ZRC.6.21802, male, BL: 33 mm, PL: 8 mm, PF: 18 mm, coll. T. M. Leong, BTNR, 5 Jun.2010.

ACKNOWLEDGEMENTS

I am grateful to the enthusiastic team of faunal survey volunteers for their field companionship during the multiple nocturnal visits to our forests. The snail prey was kindly identified by Tan Siong Kiat.

LITERATURE CITED

Ingrisch, S., 1998. Monograph of the Oriental Agraeciini (Insecta, Ensifera, Tettigoniidae): Taxonomic revision, phylogeny, biogeography, stridulation and development. *Courier Forschungsinstitut Senckenberg*, **206**: 1–391.