



Preliminary study on the wing scales of moth *Cretonotus transiens* Walker, 1855 (Lepidoptera: Erebidae)

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ABSTRACT: Dimensions of different types of scales on the wings of the moth *Cretonotos transiens* Walker were analyzed using micrometry. A total of 65 morphologically distinct types of scales were investigated, including 35 from dorsal side and 30 from ventral portion. Dorsal side scales have a length range of 82.7 to 141.3 μ and width range of 55.1 to 78.8 μ . The length of scale on the ventral region ranged from 82.7 to 133.9 μ and width 63 to 78.8 μ . On comparison with ventral side of wing most of the dorsal side scale forms are long narrow and dentate.

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KEYWORDS: Morphometric, colour patches, structural diversity, tiger moth

Tiger moth, *Cretonotos transiens* Walker, 1855 (Lepidoptera: Erebidae), is distributed from south-east Asia from India to China, South Japan, Borneo and Lombok. The pigments for various colour patterns are contained in scales of wings. These wing scales can have different shapes and pigments, enabling the formation of various colour patterns on both upper- and lower sides of the wing membranes (Eliasson *et al.*, 2005). The colours in certain scales are due to chemical pigments, while others contain ridges and prominences that cause light to reflect resulting in bright and iridescent appearance (Vukusic and Sambles, 2003). Tiger moths have been a challenging group for systematic study because their wing patterns and colours, traditionally used for species identification, are highly variable (Weller *et al.*, 1999; Schmidt, 2007) but lack reliable synapomorphies. The scale forms of moth provide an acoustic advantage by decreasing predation risk specifically to bats. A preliminary study was undertaken on morphological differences in the wing scales of moth, *C. transiens*.

Moths of *C. transiens* were collected from the gardens of Sree Narayana College, Kollam (8°52'55''N; 76°36'4''E). Scale samples from white and light brown colour portion of wings were dislodged as per the standard method of Grodnitsky and Kozlov (1991). Scales were shredded from each region of wing into a glass slide. A drop of xylene was used for fixation and the samples were studied under a light microscope. The measurements of the scales were carried out using micrometry and photomicrographs were prepared for analysis.

The fore wings are dark chestnut with the costa and cell of fore wing suffused with white in *C. transiens*. Three orbicular and reniform spots outlined in grey on discocellulars are present. It has narrowed fore wing with very pale fuscous. The costa and base of inner margin are white and black spots in and just beyond each angle of cell. Hind wings pale fuscous with broad irregular black margin bearing a black spot on discocellulars. The dorsal side and ventral side are same, so the scales are

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Plate I

Dorsal wing

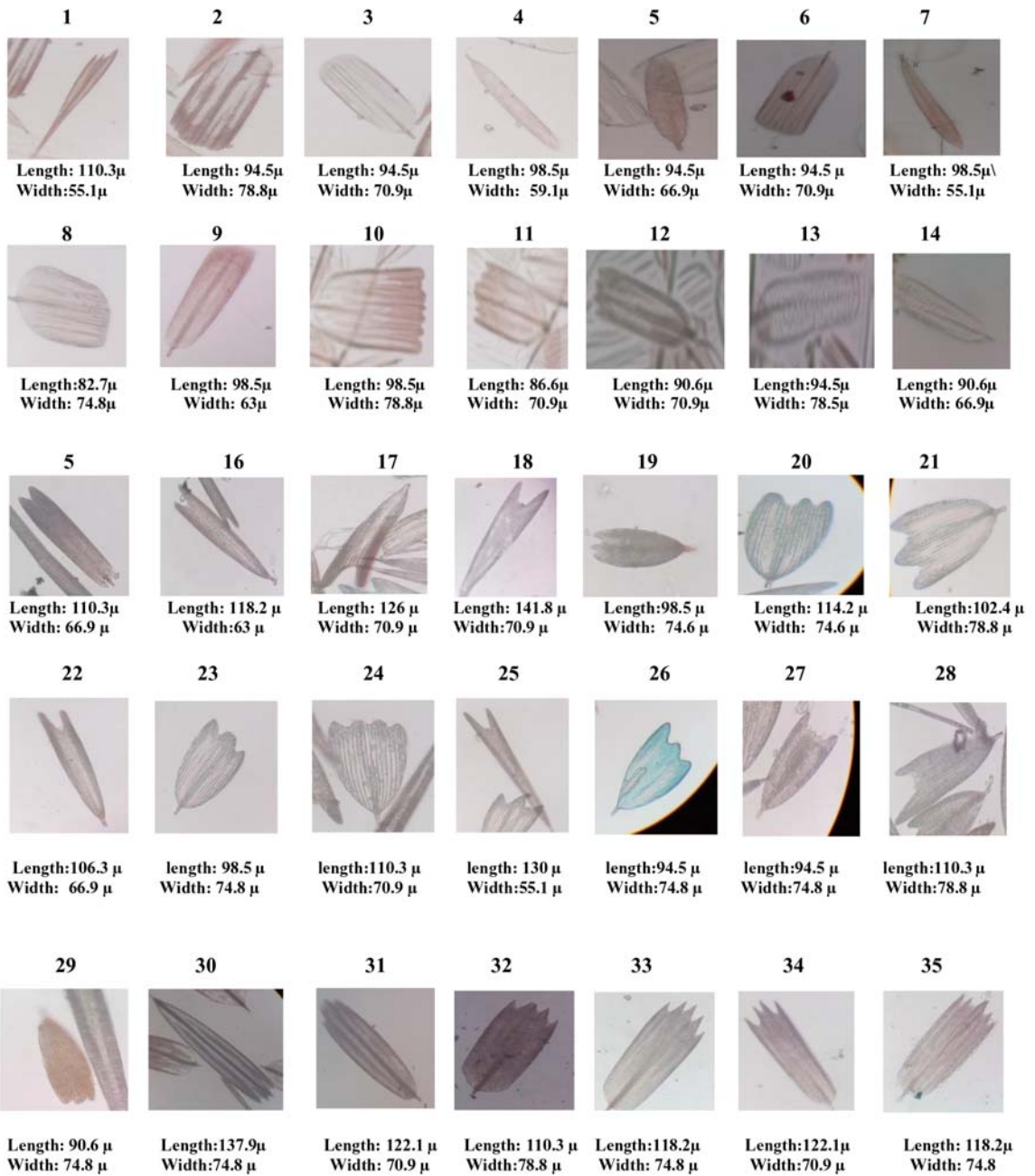


Plate II

Ventral wing



extracted commonly. The cream colour and black spot are there in the dorsal side wing but due to the too small size the individual scales cannot be taken separately. About 65 scales are observed from dorsal and ventral side. Among them 35 scales are from dorsal and 30 scales from ventral side are taken. The white colour and light brown colour scales were identified. The sharp edged end was seen in majority of scales. The dimension of the dorsal wing range from 82.7 to 141.3 μ length and 55.1 to 78.8 μ in width (Plate I – 1 to 35) and the dimension of the ventral wing range from 82.7 to 133.9 μ in length and 63 to 78.8 μ in width (Plate II - 36 to 65). On comparison with ventral side of wing most of the dorsal side scale forms are long narrow and dentate.

The colour of scales function as thermoregulatory and the scale structure also protect moths from trapped in spider webs (Zeng *et al.*, 2011). Moth scales are composed of honeycomb-like hollows analogous to sound-absorbing material which is an advantage for decreasing the predation by echolocating bats and decreases perception of moth by predators (Zeng *et al.*, 2011).

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REFERENCES

- Eliasson C.U., Ryrholm N. and Gärdenfors U. (2005) The Encyclopedia of the Swedish Flora and Fauna, Fjärilar, Dagfjärilar [Swedish] Hesperiiidae – Nymphalidae. ArtDatabanken (Swedish Threatened Species Unit), Uppsala. 407pp.
- Grodniczky D.L. and Kozlov M.V. (1991) Evolution and function of wings and their scale covering in butterflies and moths (Insecta: Papilionidae: Lepidoptera). *Biologisches Zentralblatt* 110(3): 199–206.
- Schmidt B.C. (2007) Systematics of Grammia Tiger Moths (Lepidoptera: Noctuidae). ProQuest, USA. 239 pp.
- Vukusic P. and Sambles J.R. (2003) Photonic structures in biology. *Nature* 424: 852–855
- Weller S.J., Jacobson N.L. and Conner W.E. (1999) The evolution of chemical defenses and mating systems in tiger moths (Lepidoptera: Arctiidae). *Biological Journal of the Linnean Society* 68(4): 557–578.
- Zeng J., Xiang N., Jiang L., Jones G., Zheng Y., Liu B. and Zhang S. (2011) Moth Wing Scales Slightly Increase the Absorbance of Bat Echolocation Calls. *PLoS ONE* 6(11): 1-6.