

Sommerer & Stüning from Sumatra has this area extensively marked with longitudinal, black stripes and the number of dull orange stripes is reduced.

B. monochrias Meyrick, described from Sangihe Island, and its subspecies *cuneiplena* Swinhoe (Mindanao) and *benguetana* Schultze (Luzon) exhibit comparatively strong differences.

B. georgiata Guenée, with the nominate subspecies, found in Sumatra, Borneo, Peninsular Malaysia and Sulawesi, similar in pattern and coloration to *B. maculosa*, its race *pervasata* Walker from Java also with additional, dull orange streaks. The name *pervasata* is applied to several more or less different island races (Buru, Seram, several Philippine islands) at present which may deserve subspecies-rank as

well. In Sulawesi, the nominate *georgiata* seems to occur sympatrically with its race *pervasata*, but studies of the genitalia structures have revealed that the *pervasata*-like form is specifically different. This phenomenon may be explained by subsequent arrival (of *georgiata*) after initial vicariance, as observed also in other groups of moths and butterflies.

The conspicuous pattern of adult *Bracca* moths and their larvae – the latter are strikingly coloured with red, black and white elements – may indicate that they are distasteful or toxic for predators. Consequently, mimicry phenomena are a possible explanation for the development of those strongly different island races, encountered in the genus *Bracca* so explicitly.

Diversity and Phenology of Geometridae in coastal Central Queensland

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Light trapping was carried out on 5 nights per week over 7 years at Rockhampton in Central Queensland, circa 40 km inland. Rockhampton lies close to the Tropic of Capricorn in an arid corridor between wetter regions, north to Mackay, and south-east Queensland. The December mean maximum temperature is 31.4 °C and the mean minimum for July is 22.9 °C. The mean number of rain days per year is 92. Good rain events are often associated with cyclones during the wet (hot or summer) season.

Most collecting was carried out during low to average rainfall periods, with 1983 having the highest rainfall and 1982 the lowest. The trap was a Robinson style trap located in the University grounds and was surrounded by Eucalyptus 'scrub' which is regrowth, possibly 40 years old at the time of trapping. The daily catch was identified and recorded using 'Rothampstead Weeks'. Seasons were allocated as follows: Summer, weeks 49-9; Autumn, weeks 9-21; Winter, weeks 22-34; Spring, weeks 35-48.

Trapping yielded 13,324 individuals and 123 species of Geometridae. Between 53 and 84 species were recorded each year. Ennominae accounted for 38 species; Sterrhinae, 23 species; Geometrinae, 35 species; Larentiinae, 10 species; Oenochrominae 17 species. Of the 10 most abundant species 2 were Ennominae, 4 Oenochrominae, 1 Geometrinae and 3 Sterrhinae. A species accumulation curve calculated using EstimateS (Colwell 2005) predicted a

total fauna 136 geometrid species. There is a relationship between annual rainfall and the number of geometrid species present each year. However, using Ecosim (Gotelli and Entsminger 2001) to standardise the annual community to 1000 individuals shows there to be few significant differences between years. In wet years more species were collected because many species become more abundant and are therefore more likely to be collected.

Phenology of the species was assessed by pooling the annual counts on a weekly basis and some illustrative examples are presented. *Arhodia lasiocamparia* (Oenochrominae) is present throughout the year. *Oenochroma pallida* (Oenochrominae) is another relatively common species with probably 3 discreet generations in summer, autumn and spring but which is not present in winter (the dry season). *Cleora decisaria* (Ennominae) is present all year, but with ~85 % of occurrences in autumn and spring. *C. acaciaria* (?*illustraria*) also appears to be an autumn and spring species. *Pachyplocia griseata* (Ennominae) appears to be a summer, autumn, winter species. *Psilalcis isombra* (Ennominae) occurs predominantly in winter and spring. *Scopula innocens* (Sterrhinae) is a spring-summer-autumn species. *S. rubraria* is an autumn-winter-spring species with only 1 occurrence in 7 years in late summer. This species was first found in 1985 and then in subsequent years in increasing abundance as was the spring time species *Zermizinga sinuata* (Ennominae). *Mixocera latilineata*

(Geometrinae) is found in late spring but is predominantly a summer and autumn species. *Prasinocyma rhodocosma* (Geometrinae) is a common species which can be found throughout the year, but given its abundance, it has very few occurrences (7 %) in spring. There also seems to be some indication of several distinct generations throughout the year.

References

- Colwell, R. K. 2005. EstimateS: Statistical estimation of species richness and shared species from samples. Version 7.5. User's Guide and application at: <http://purl.oclc.org/estimates>.
- Gotelli, N. J. & G. L. Entsminger 2001. EcoSim: Null models software for ecology. Version 7.0. Acquired Intelligence Inc. & Kesey-Bear. <http://homepages.together.net/~gentsmin/ecosim.htm>.

Towards a global online information system Geometridae (GlobInG)

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The GlobInG project aims to improve access to

- collections by providing digital photographs of the ca. 5000 primary type specimens of Geometridae stored in German museums and by inventorying accompanying scientific data (examined primary data)
- relevant literature data with scientific control of taxonomic status and nomenclatural availability; as far as possible with digital facsimile of original description

Until today 1500 primary types are photo-documented, including more than 4000 picture data of dorsal and ventral view of the specimens and the labels. To date, about 800 object data sets (including all primary types of the Herbulot collection at the ZSM) are processed in detail and are integrated into the existing database according to the standards of the GART/GloBIS project on the butterflies of the world. For this the respective original descriptions were evaluated and all relevant taxonomic information was included into the database. These data sets contain the citation of the original description, information about the locus typicus, a listing of the type material, and, additionally, the digital photographs of each specimen mentioned above. So far the database contains 2000 image data sets of these completely processed primary types, 300 accompanying literature data sets, 400 image data sets of the facsimile of the original descriptions and 150 images of genitalia slides. The data are accessible through the internet-based SYS-

TAX database system at Ulm University (SYSTAX; GBIF-D). Sustainability is guaranteed by continuous maintenance through ZSM. Similarly, Geometridae types from other collections in Germany and other countries have been inventoried within the framework of the FORUM HERBULOT initiative, thus great international impact is expected from both of these activities, and Geometridae as model group will get established further for various kinds of research.

At the Forum Herbulot 2006, two strategies are proposed for the future and disposed to discussion, in order to integrate other existing data sets worldwide into the 'Global Information System Geometridae' ('GlobInG-Input-Light' and 'GlobInG-Input-Full').

SYSTAX:

http://www.biologie.uni-ulm.de/systax/daten/index_e.html

SYSTAX: Geometridae (List of Taxa):

<http://www.biologie.uni-ulm.de/cgi-bin/portal/portal.pl?tquery=geometridae&cquery=&locquery=&longfrom=&longto=&latfrom=&latto=&labquery=&iquery=&query=&wrapper=0&data=all&typus=yes&sort=tax&displ=s&lang=e&sid=T&expert=yes&acro=ZSM>

GBIF-D:

http://www.biologie.uni-ulm.de/cgi-bin/query_all/query_all.pl?lang=d&pr=gbif-e1