



Zygaena filipendulae

Zygaenidae

Burnet Moths, Forester Moths

Biosecurity

BIOSECURITY ALERT

This Family is of Biosecurity Concern

Occurrence

This family occurs in Australia.

Background

The Zygaenidae, known as burnets or foresters, are a world-wide family with over 1000 species with a mainly tropical and Palearctic distribution. In Australia there are 43 species all belonging to the same tribe, the Artonini in the subfamily Procrinae. Both adults and larvae are well-known for their impressive chemical defence using cyanogenic chemicals, and highly aposematic colours and patterns warning potential predators of their distastefulness. The adult moths can release hydrocyanic acid and the caterpillars discharge droplets from stores of defence chemicals in special cuticular cavities in their bodies.

Subfamilies

- Callizygaeninae
- Chalcosiinae
- Procrinae
- Zygaeninae

All New World species are in the subfamily Procrinae.

Short Description

Adapted from Epstein *et al.* (1999) and Niehuis *et al.* (2006)

Mature caterpillars are stout, broad and dorsoventrally flattened. However caterpillars from the Callizygaeninae look somewhat different to those in the other subfamilies, resembling more the larvae of the Limacodidae (cup moths). The head is retractile and hidden under the fleshy prothorax.

They are often brightly coloured with aposematic patterns to ward off predators (Fig. 1).



Fig. 1. Mature caterpillar of the six-spot burnet (*Zygaena filipendulae*) (Zygaenidae: Zygaeninae). Note flattened body shape, retracted head, multiple secondary setae on verrucae and warning pattern and colour. Photo by Harald Süpfle - Own work. Creative Commons Attribution-Share Alike 2.5 Generic license.

Diagnosis

Adapted from Epstein *et al.* (1999), Niehuis *et al.* (2006) and Stehr *et al.* (1987)

1. Presence of cuticular cavities for the storage of cyanogenic compounds in most segments (Fig 2). These are internal structures but when disturbed the caterpillars produce defensive droplets arising from the cavities. Present in the Zygaeninae and Chalcosiinae. Secondly lost in the other subfamilies. This characteristic is believed to be **plesiomorphic** in the Zygaenidae.
2. The thoracic legs have an **apical** pair of **spatulate** setae. In Zygaeninae, Chalcosiinae and Procridinae. Also in the Elachistidae.
3. Crochets in a **uniordinal mesoserries**. In Zygaeninae, Chalcosiinae and Procridinae.
4. Head retractile (Fig. 1). In Zygaeninae, Chalcosiinae and Procridinae. Similar to the **Hesperidae**, but head narrower than T1 in the Zygaenidae, rather than wider in the former family (see **Hesperidae** Fact Sheet).
5. **Integument** covered with short, dense **spinules**. In Zygaeninae, Chalcosiinae and Procridinae.
6. Unusual, mouthlike 'gland' near the A2 and A7 spiracles. In the Procrididae.
7. 'Gland' at the base of the T1 leg. In the Procridinae.

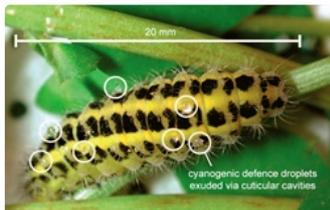


Fig. 2 *Zygaena filipendulae* larva feeding on its cyanogenic host plant *Lotus corniculatus*. Internal cuticular cavities exude stored cyanogenic glucoside defence compounds (circled) when caterpillar disturbed. Image from Jensen *et al.* (2011)

Detailed Description

Adapted from Epstein *et al.* (1998) and Niehuis *et al.* (2006)

The following description applies to the Zygaeninae, Chalcosiinae and Procridinae. Larvae of the Callizygaeninae are similar in shape to those of the Limacodidae (see Limacodidae Fact Sheet), and are brightly coloured and sluggish.

Head: Head capsule usually retracted under the extended prothorax (Fig. 1). The antennae are long. Six stemmata are present.

Body: Integument rough or spinose. The body is covered with dense secondary setae supported by dorsal, lateral and subventral verrucae (Fig. 1). Most segments have two types of internal cuticular cavities for storing cyanogenic chemicals. Both are connected to the exterior through specialised openings. The Procrididae have glands at the base of the T1 leg and near the spiracles on A2 and A7.

Thorax: The legs have an apical pair of spatulate setae of similar size to the claw.

Abdomen: The prolegs are short, with a row of soft basal plates ventral to the crochets. Crochets are arranged in a uniordinal mesoserries.

Species of Biosecurity Concern

THE FOLLOWING SPECIES IS OF BIOSECURITY CONCERN TO NORTHERN AUSTRALIA

***Palmartona catoxantha* (coconut leaf moth) (Zygaenidae: Procrididae: Artonini)**

This species is the only exotic zygaenid that has been recorded in Australia (Queensland, from one record). It is a recognised pest on coconut palms.

Description

Adapted from Tarmann (2005).

The mature caterpillar is slug-like – stout, broad and dorso-ventrally flattened. The ground colour of the body is yellow, but is much paler in early instars. The head is also yellow with dark brown mandibles. The second thoracic segments has a few dark stripes. T3 and the abdominal segments are a more greenish-yellow with a dark violet mid-dorsal stripe and dark lateral stripes.

Diagnosis

From Tarmann (2005).

1. An inflated second thoracic segment (particularly in the early instars).
2. Strong host plant association with palms (Arecaceae)

Other related zygaenids in this tribe (the Artonini), where known, feed on Poaceae (mostly bamboo) and Zingiberaceae (ginger).

Biology and Feeding Damage

Early instars skeletonise leaves whereas the mature larvae eat the edges of leaves causing characteristic holes.

Current Distribution

- Queensland, Australia (from one record)
- Myanmar
- Malaysia
- Singapore
- Indonesia
- The Philippines
- Papua New Guinea

Caterpillar Host Plants

- coconut (*Cocos nucifera*)
- fan palm (*Livistona*)
- sago palm (*Metroxylon*)
- banana (*Musa*)
- sugar cane (*Saccharum*) (rarely)

References

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Authors

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