

Genus *Gnophodes* Doubleday, [1849] Evening Browns

In: Doubleday & Westwood, [1846-52]. *The genera of diurnal Lepidoptera*, London: 353; pl. 61 (1: 1-250 pp.; 2: 251-534 pp.). London.

Type-species: *Melanitis parmeno* Doubleday, by monotypy.

The genus *Gnophodes* belongs to the Family Nymphalidae Rafinesque, 1815; Subfamily Satyrinae Boisduval, 1833; Tribe Melanitini Reuter, 1896. The other genera in the Tribe Melanitini in the Afrotropical Region are *Melanitis*, *Haydonia* and *Ducarmeia*.

Gnophodes (**Evening Browns**) is an Afrotropical genus of five species.

**Gnophodes betsimena* (Boisduval, 1833) Yellow-banded Evening Brown

Cyllo betsimena Boisduval, 1833. *Nouvelles Annales du Muséum d'Histoire Naturelle, Paris* 2: 206 (149-270).
Gnophodes betsimena (De Boisduval, 1833). Pringle *et al.*, 1994: 50. [misspelling of author's name]
Gnophodes betsimena (Boisduval, 1833). Pyrcz *et al.*, 2020: 174. **stat. rev.**

Alternative common name: Banded Evening Brown.

Type locality: Madagascar: "Tamatave [Toamasina]". Types apparently lost (Pyrcz *et al.*, 2020).

Diagnosis: FW subapical band much wider than in *G. parmeno* and *G. diversa*, and differently shaped, with straight inner edge, not outcurved. Also much larger than other two species (Pyrcz *et al.*, 2020).

Distribution: Madagascar.

Specific localities:

Madagascar – Tamatave (TL); Marojejy N.P. (Pyrcz *et al.*, 2020); Rte Anosibe (Pyrcz *et al.*, 2020); La Mandraka (Pyrcz *et al.*, 2020).

Habitat: Dense forest.

Habits: Nothing published.

Early stages: Nothing published.

Larval food: Nothing published.

**Gnophodes diversa* (Butler, 1880)# Southern Yellow-banded Evening Brown



Male Yellow-banded Evening Brown (*Gnophodes betsimena*), Port St Johns.
Image courtesy Steve Woodhall.

Gnophodes parmeno Doubleday. Trimen, 1866a. [Misidentification]
Cylo diversa Butler, 1880. *Annals and Magazine of Natural History* (5) 5: 333 (333-344, 384-395).
Melanitis diversa (Butler, 1880). Trimen & Bowker, 1887a.
Melanitis diversa Butler, 1880. Swanepoel, 1953a.
Gnophodes betsimena diversa Butler, 1880. Dickson & Kroon, 1978.
Gnophodes betsimena diversa (Butler, 1880). Pringle *et al.*, 1994: 51.
Gnophodes diversa (Butler, 1880). Pyrcz *et al.*, 2020: 176. **stat. reinst.**



Gnophodes diversa. Male (wet season form) (Wingspan 59 mm). Left – upperside; right – underside.
 Umtamvuna River, KwaZulu-Natal, South Africa. 28 December 2004. J. Dobson.
 Images M.C. Williams ex Dobson Collection.



Gnophodes diversa. Female (wet season form) (Wingspan 64 mm). Left – upperside; right – underside.
 Umtamvuna River, KwaZulu-Natal, South Africa. 15 December 2010. J. Dobson.
 Images M.C. Williams ex Dobson Collection.



Gnophodes diversa. Male (dry season form) (Wingspan 61 mm). Left – upperside; right – underside.
Port St Johns, Eastern Cape Province. 23 March 2008. J. Dobson.
Images M.C. Williams ex Dobson Collection.



Gnophodes diversa. Female (dry season form) (Wingspan 67 mm). Left – upperside; right – underside.
Port St Johns, Eastern Cape Province. 23 March 2008. J. Dobson.
Images M.C. Williams ex Dobson Collection.

Type locality: [South Africa]: “Port Natal”.

Diagnosis: Intermediate in terms of size, wing shape and colour patterns between *G. parmeno* and *G. betsimena*. Larger than *G. parmeno* but noticeably smaller than *G. betsimena*. As with *G. betsimena*, sexual dimorphism is very slight, in contrast to well-developed dimorphism in *G. parmeno*. In both sexes subapical band is wide and light yellow, but invariably narrower than in *G. betsimena* and with irregular zigzagging inner edge (as opposed to straight in *G. betsimena*). Underside patterns variable but less irrorated with dark brown speckling than in *G. parmeno* (Pyrz *et al.*, 2020). The species is morphologically variable, indicating that ecotypes and/or subspecies may be involved. However, this requires further study (Pyrz *et al.*, 2020).

Distribution: Kenya (east, north), Tanzania, Malawi, Mozambique, Zimbabwe (east), South Africa (KwaZulu-Natal, Eastern Cape Province).

Specific localities:

Kenya – Mount Marsabit (Larsen, 1991c); central highlands (Larsen, 1991c); Shimba Hills (Larsen, 1991c).

Tanzania – Northern, eastern and southern parts, west to Tukuyu (Kielland, 1990d); Moshi (Liseki & Vane-Wright, 2015); New Moshi (Liseki & Vane-Wright, 2015); Engare-Nairobi (Liseki & Vane-Wright, 2015); Taveta (Liseki & Vane-Wright, 2015).

Mozambique – Maronga Forest (Pringle *et al.*, 1994); Amatongas (Pringle *et al.*, 1994); Dondo Forest (Pringle *et al.*, 1994); Vila Gouveia (Pringle *et al.*, 1994); Mount Chiperone (Timberlake *et al.*, 2007); Mt Namuli (Congdon *et al.*, 2010); Mt Mabu (Congdon *et al.*, 2010); Mt Mecula [-12.0772

37.6297] (Congdon & Bayliss, 2013); Mt Yao [-12.4432 36.5114] (Congdon & Bayliss, 2013).
Zimbabwe – Mount Selinda (Pringle *et al.*, 1994); Mutare (Pringle *et al.*, 1994); Vumba (Laurenceville Road) (Pringle *et al.*, 1994).

KwaZulu-Natal – Durban (TL); Pinetown (Trimen & Bowker, 1887); Oribi Gorge (Swanepoel, 1953); Verulam (Swanepoel, 1953); Ndumu (Pringle *et al.*, 1994); Port Shepstone (Williams).

Eastern Cape Province – Port St Johns (Swanepoel, 1953); Embotyi Forest (Pringle *et al.*, 1994); Bashee River mouth (Pringle *et al.*, 1994).

Habitat: Dense forest and gallery forest. Also in heavy woodland (Kielland, 1990d). In Tanzania *diversa* is found from near sea-level to 1 600 m, occasionally 2 000 m (Kielland, 1990d).

Habits: A fairly common butterfly that flies at dusk and dawn. During the day it rests among leaf litter in deep shade (Pringle *et al.*, 1994). They appear to roost in small groups of about half a dozen, but the individuals of each group are a few metres apart from each other (Larsen, 1991c). Both sexes are attracted to fermenting fruit (Pringle *et al.*, 1994). The wet- and dry-season forms differ only slightly from each other. The only records of the wet-season form from southern Africa appear to have been from the Mozambique forests (Pringle *et al.*, 1994). In December 2004 the Dobson's found specimens of the wet season form on the Umtamvuna River in KwaZulu-Natal in South Africa (specimens illustrated under ssp. *diversa*, below).

Flight period: All year but appears to be most common from March to August (Pringle *et al.*, 1994). Peak abundance from April to June (Woodhall, 2005).

Early stages:

Trimen & Bowker, 1887, Vol. 1: 118 [as *Melanitis diversa* (Butler); Pinetown, KwaZulu-Natal].

“**Larva.** Ground-colour yellow; a median dorsal green stripe, and some narrower ones on each side, from head to tail. Both head and tail forked. About two inches long.” - J.H. Bowker's description of two specimens found at Northdene, near Pinetown, Natal, feeding on “Ribbon Grass”, May 1885. **Pupa.** Bright grass-green throughout, semi-transparent, surface like shining wax. No markings of any kind; rather paler on wing-covers. Length, 10 lines. Thick and rounded, especially the abdomen, which is dorsally globose and very strongly convex. The main dorsal prominence highly ridged and rather acute. Head blunted, not bifid, but with two minute pointed tubercles on eye-covers. I received the pupa here described on 22nd May 1885, from Colonel Bowker, who wrote that it was developed from one of the two larvae above mentioned. It was suspended by a well-developed caudal stalk to a small but dense silken web on the under surface of a leaf of broad ribbed grass. The imago, a fine female of *M. diversa*, appeared on May 31st. Colonel Bowker subsequently sent me a crippled *M. diversa* produced from the other pupa, which he retained in Natal.”

Clark, in Van Son, 1955: 27. [as *Gnophodes parmeno diversa* (Butler, 1880).]

Egg – 1 mm high and 1,25 mm in diameter; three quarters of a sphere, with bottom truncated; a very faint indented tracery over upper portion; almost white when laid, becoming faint yellow-green, until black head of developing larva begins to show through shell; egg stage 7-8 days. **First instar larva** – eats way out of top of shell; 2,25 mm long; pure white; head black-brown with two almost white moles on top, from sunken crown of each of which arises a short curved black spine; remaining spines or setae black, on dull white moles; a double row of black spines on white moles on dorsum, those on right lean forward on segments 1-10 and on left those on segments 1-3 also lean forward, the remainder lean backward; a subdorsal row of smaller spines on each side, all of which point forward on segments 1-10 and backward on remainder; spines in a double row on lateral line also lean same way; on lateral ridge first three segments have a pair of black spines each; on segments 4-11 are five sprayed out spines on each segment, four are water-white and posterior upper one is black; final segment forked and each prong bears some eight black spines; as soon as it feeds assumes a greenish shade and later a white lateral line develops; larva lies along and feeds on edge of a blade of grass; grows to 6 mm in 7-8 days; moulting takes place on a silken mat where larva is feeding. **Second instar larva** – green above with whitish lateral line, the green intensifying to ridge but fading there and almost white ventrally; head brown and covered with small black spines, with two protuberances extending from top; in resting position head is held down so that protuberances point forward; final segment strongly forked, tips being slightly touched with grey, which is accentuated by numerous black spines; body covered with black spines on white moles arranged in regular rows above but becoming more irregular below lateral line; primary setae of first instar still fairly prominent; grows to 13 mm in 5-7 days. **Third instar larva** – green with thin dorsal line of a darker shade, flanked with dull white; subdorsal line indistinct, being only slightly darker than ground colour, but edged with white below; a white lateral line extending over forked projections of final segment; lateral ridge with a touch of white in centre of each segment; ventral portion green; head black-brown, covered with black spines and projections longer; in some larvae a trace of pale yellow-green on adfrontal; setae relatively smaller and a few more below lateral line;

grows to 17,5 mm in 6-7 days. **Fourth instar larva** – yellow-green, shading to green just above white lateral ridge; narrow dorsal line thinning and darkening towards head; this line very thinly edged by white towards head, broadening considerably and darkening towards head, but disappears on segment 11; bordered below with white, which joins white lateral line towards head and on segment 10; ventral portions pale green, whitening slightly over bulges; forks of final segment long and fold along sides of object when larva is at rest, making it very inconspicuous; head mainly black, with back of top portion and part of adfrontal green; projections longer than in previous instar and head covered with fairly long, fine, hairy spines; grows to 28 mm in about 6 days. **Fifth (final) instar larva** – yellow-green, shading to green just above white lateral ridge; dorsal line indistinct on first three segments, clearly visible, though narrow, from segment 4, fading on segment 11; dorsal line edged with white from segment 4, the white being indistinct on first three segments, leaving a broad green stripe over dorsum; subdorsal line very thin but broadly edged and combines with lateral line at both extremities, leaving a very thin line between them on centre segments; ventral portions pale light green; head green with black patches on epicrania, or black with green crown and adfrontal, the green sometimes extending to the epicrania; head covered with long thin hairs, black in the dark coloured bands and whitish in the lighter; spiracles white with salmon centre, the whole encircled by black rim; forked projections at each extremity now very long and serve to camouflage larva; grows to 51-52 mm in 10 days; in prepupal phase larval colour fades to pale watery green; spins a silken mat from which it hangs by anal claspers. **Pupa** – suspended, head downward, from silken mat by cremastral hooks; uniformly yellow-green in colour; surface devoid of setae; pupal stage 14 days.

Congdon et al., 2017 [final instar larva; ssp. *diversa*].

Pyrz et al., 2020 [fourth and final instar larva; pupa; *diversa*].

Larval food:

Ehrharta erecta Lam. (Poaceae) [Clark, *in* Dickson & Kroon, 1978: 35; in captivity].

Panicum deustum Thunb. (Poaceae) [Paré, *in* Pringle et al., 1994: 51; Chirinda Forest and elsewhere in Zimbabwe].

Ribbon grass (Poaceae) [Bowker, *in* Trimen & Bowker, 1887, Vol. 1: 118; Pinetown, KwaZulu-Natal].

Setaria palmifolia (J. König) Stapf (Poaceae) [Congdon et al., 2017; Nyachilo, Tanzania].

Setaria species (Poaceae) [Pringle et al., 1994: 51].

**Gnophodes parmeno* Doubleday, [1849] Western Yellow-banded Evening Brown

Gnophodes parmeno Doubleday, [1849] *in* Doubleday & Westwood, [1846-52]. *The genera of diurnal Lepidoptera*, London: pl. 61 [1849], 363 [1851] (1: 1-250 pp.; 2: 251-534 pp.). London.

Gnophodes betsimena parmeno Doubleday, [1849]. Ackery et al., 1995.

Gnophodes parmeno Doubleday, [1849]. Pyrcz et al., 2000: 174. **stat. reinst.**



Gnophodes parmeno. Male (Wingspan 55 mm). Left – upperside; right – underside.
Biakpa Mountain Paradise, Ghana. 23 November 2011. J. Dobson.
Images M.C. Williams ex Dobson Collection.



Gnophodes parmeno. Female (Wingspan 59 mm). Left – upperside; right – underside.
 Biakpa Mountain Paradise, Ghana. 23 November 2011. J. Dobson.
 Images M.C. Williams ex Dobson Collection.

Type locality: No locality given. Type not examined by Pycrz *et al.*, 2020.

Diagnosis: Considerably smaller than *G. diversa* and *G. betsimena*. In *G. parmeno* subapical bands pale yellow, faint in females and nearly obsolete in some males; in other two species FW subapical bands bright yellow in both sexes (Pycrz *et al.*, 2020).

Distribution: Guinea-Bissau (Aurivillius, 1910), Guinea, Sierra Leone, Liberia, Ivory Coast, Ghana, Togo, Benin (south, central), Nigeria (south and Cross River loop), Cameroon, Equatorial Guinea (Bioko), Gabon, Congo, Angola, Democratic Republic of Congo, Sudan (south), Burundi, Uganda, Ethiopia, Tanzania (west), Zambia (north).

Recorded, in error, from Kenya by Larsen, 1991c (Pycrz *et al.*, 2020).

Specific localities: [see also Pycrz *et al.*, 2020]

Guinea – Ziama (Safian *et al.*, 2020).

Liberia – Wologizi (Safian *et al.*, 2020); Wonegizi (Safian *et al.*, 2020).

Ivory Coast – Lamto (Vuattoux, 1994); Bossematie (H. Fermon, *vide* Larsen, 2005a).

Ghana – Bobiri Butterfly Sanctuary (Larsen *et al.*, 2007); Boabeng-Fiema Monkey Sanctuary (Larsen *et al.*, 2009).

Benin – Houeyogbe Forest (Coache & Rainon, 2016).

Nigeria – Obudu Plateau (Larsen, 2005a).

Cameroon – Korup (Larsen, 2005a).

Gabon – Bitam (Vande weghe, 2010); Ipassa (Vande weghe, 2010); Waka (Vande weghe, 2010).

Democratic Republic of Congo – Ituri Forest (Ducarme, 2018); Semuliki Valley (Ducarme, 2018); Central Forest Block (Ducarme, 2018); Mt Mitumba (Ducarme, 2018); Mt Blue (Ducarme, 2018).

Uganda – Semuliki N.P. (Davenport & Howard, 1996); Mpanga Forest (Pycrz *et al.*, 2020); Impenetrable Forest.

Tanzania – From Mpanda to the Ugandan border (Kielland, 1990d).

Zambia – Ikelenge (Heath *et al.*, 2002); Ndola (Heath *et al.*, 2002); Lumangwe Falls (Heath *et al.*, 2002).

Habitat: Rainforest, rarely above 1200 m. (Pycrz *et al.*, 2020). In Tanzania *parmeno* is found at altitudes from 800 to 2 000 m.

Habits: Nothing published.

Early stages: Nothing published.

Larval food:

Rottboellia cochinchinensis (Lour.) Clayton (Poaceae) [Vuattoux, 1994; Lamto, Ivory Coast; as *Rottboellia exaltata*].

Setaria barbata (Lam.) Kunth (Poaceae) [Vuattoux, 1994; Lamto, Ivory Coast].

Setaria megaphylla (Steud.) T. Durand & Schinz (Poaceae) [Vuattoux, 1994; Lamto, Ivory Coast].

Sorghum arundinaceum (Dcv.) Stapf (Poaceae) [Vuattoux, 1994; Lamto, Ivory Coast].

Note: Larsen (2005a) implies that the populations in highland Nigeria and Cameroon may represent a distinct species.

dubiosa Aurivillius, 1911 *in* Seitz, 1908-25 (as f. of *Gnophodes betsimena parmeno*). *Die Gross-Schmetterlinge der Erde*, Stuttgart (2) 13 *Die Afrikanischen Tagfalter*: 83 (614 pp.). Cameroon.

****Gnophodes heroni* Pycrz & Collins, 2020**

Papilio heroni Pycrz & Collins, 2020. *EArthropod Systematics & Phylogeny* 78 (2): 177 (171-216).

Type locality: Cameroon: Moumekeng, Manengouba Mountain, western Cameroon, Manjo. Holotype (male) 4-12 November 2012; in ABRI collection, Nairobi (ABRI-2018-4391).

Diagnosis: Most closely resembles *G. parmeno* from which it differs by its somewhat larger size, rounder FW with less produced apical area, and most noticeably, in males, by the fact that the blackish brown ground colour of the upperside FW is the same as on the HW, whereas in *G. parmeno* the FW is blackish brown but the HW is lighter brown. In addition, the FW subapical band is better marked, lighter, and yellow instead of orange with a brownish cast, and displaced distally in relation to that of *G. parmeno* (Pycrz *et al.*, 2020).

Distribution: Nigeria, Cameroon, Democratic Republic of Congo, Uganda, Kenya.

Specific localities:

Nigeria – Cross River S. (Pycrz *et al.*, 2020); Obudu Cattle Ranch (Pycrz *et al.*, 2020).

Cameroon – Moumekeng (TL); Mt Koupe (Pycrz *et al.*, 2020); Tabenken (Pycrz *et al.*, 2020); Koutaba (Pycrz *et al.*, 2020).

Democratic Republic of Congo – Lubango (Pycrz *et al.*, 2020).

Uganda – Kalinzu (Pycrz *et al.*, 2020); Kyeljolo (Pycrz *et al.*, 2020); Katera (Pycrz *et al.*, 2020); Kibale N.P. (Pycrz *et al.*, 2020); Kadam Mountain (Pycrz *et al.*, 2020).

Kenya – Kakamega (Pycrz *et al.*, 2020).

Habitat: Montane forest, above 1500 m. (Pycrz *et al.*, 2020).

Habits:

Early stages:

Pycrz *et al.*, 2020 – image of 5th instar larva.

Larval food:

Setaria sp. (Poaceae) [Pycrz *et al.*, 2020].

****Gnophodes grogani* Sharpe, 1901**

Congo Evening Brown

Gnophodes grogani Sharpe, 1901. *Annals and Magazine of Natural History* (7) 8: 279 (278-286).

Type locality: [Democratic Republic of Congo]: “Mushari”. Provenance of type unknown (Pycrz *et al.*, 2020).

Diagnosis: *Gnophodes grogani* male characterized by large tuft of androconial scales on the FWD; female could occasionally be confused with large individuals of *G. diversa*, however the two are not sympatric (Pycrz *et al.*, 2020).

Distribution: Democratic Republic of Congo (east – Kivu), Uganda (west), Rwanda, Burundi.

Specific localities:

Democratic Republic of Congo – Mushari (TL); Semuliki Valley (Ducarme, 2018); Mt Mitumba (Ducarme, 2018); Mt Blue (Ducarme, 2018); Butuhe (Pycrz *et al.*, 2020); Biakara (Pycrz *et al.*, 2020); Muleke Terr. (Pycrz *et al.*, 2020); Mihunga (Pycrz *et al.*, 2020); Mamove (Pycrz *et al.*,

2020); Kanyambia (Pyrz *et al.*, 2020); Bukavu (Pyrz *et al.*, 2020); Maboya (Pyrz *et al.*, 2020); Nyungwe (Pyrz *et al.*, 2020); Kahusi (Pyrz *et al.*, 2020); Chibumbiro (Pyrz *et al.*, 2020); Mabeloko (Pyrz *et al.*, 2020).

Uganda – Kigezi (Pyrz *et al.*, 2020).

Rwanda – Bururi (Pyrz *et al.*, 2020); Kigezi (Pyrz *et al.*, 2020).

Burundi – Ndora (Pyrz *et al.*, 2020); Rusarenda (Pyrz *et al.*, 2020).

Habitat: Montane forest, above 1800 m. (Pyrz *et al.*, 2020).

Early stages: Nothing published.

Larval food: Nothing published.