

Urania fulgens and other Lepidoptera migrations in Belize, Central America.

Jan C. Meerman & Tineke Boomsma

Belize Tropical Forest Studies, P.O.Box 208, Belmopan, Belize, E-mail: TFS@POBOX.COM

Urania fulgens

Urania fulgens (Uraniidae) is a day-flying moth. It is medium sized, black with metallic green bands and long tails on the hindwings. The moths are quite spectacular to see and could easily be mistaken for a swallowtail (Papilionid) butterfly. Since they are normally diurnal it is uncommon for this species to be attracted to light (Smith, 1992).

In its larval stage, this moth feeds on *Omphalea* spp. (Euphorbiaceae), none of which have been reported from Belize (Dwyer & Spellman, 1981). The moth has reproductive populations in Veracruz, Mexico, south on the Pacific side to Guatemala and El Salvador then there is a gap in distribution. Reproductive populations have again been reported from Costa Rica and Panama (Smith, 1992).

The first record we have of a *U. fulgens* from Belize originates from a single wing we picked up from the street in the center of Belize City. Our first living *U.*

fulgens we saw on the early morning of August 10, 1995, at Monkey River Village in the Toledo district.

More than two weeks later, on August 26, again in Monkey River Village, 9 specimens (2m, 7f) appeared at UV lights between 2300 h and 2400 h. During the next two days 3 more moths were seen either early in the morning or late in the afternoon (Meerman, 1995). All individuals appeared to be moving in a northerly direction.

Back home at the Belize Tropical Forest Studies (BTFS) headquarters in the Cayo district, we started seeing the moths on August 28. Initially only between 1700 h. and 1800 h. On August 30, under overcast skies, the migration really picked up. There was activity all day long and all moths were flying exactly compass north.

We counted specimens over a 50 m wide transect and individual moths appeared at a rate of 1 per minute. There were no congregations. All moths flew low, hugging the ground when possible. Intensity dropped during sunny moments and increased again as soon as cloud cover returned. The moths were difficult to catch but we managed to catch 9 specimens (3m, 6f).

From August 31 to September 5 there appeared to be a strong countrywide migration. Numbers were relatively "low", and most individuals were keeping close to the ground. Their high speed and direct movement made them obvious only when crossing rivers and/or roads. We saw many specimens crossing all along the highway from San Ignacio to Belize City. We also received records from Caye Caulker (Ellen MacRae, pers. com.).

Dozens of dead specimens were found on the road. Movement was still deliberately north, only on September 1 we saw two

soaring individuals. Based on our counts and on the fact that the migratory path appeared to be countrywide, it appears that anywhere between 1 and 2 million moths a day may have passed through Belize during this period.

On September 6, the migration appeared to slow down. A few were now flying SE. Others seemed to move without any direction at all. One individual was seen puddling at the edge of a pond at BTFS. In the Cayo district, this pattern continued to September 13, but on September 10, in San Pedro, Ambergris Caye, there was a strong southward migration along the beach. Five moths passed by per minute. The direction was obvious but movements appeared less hurried than during the northward migration.

After this, observations became erratic: on September 20, two moths were seen in Belmopan flying north. On October 3, at Bacalar Chico National Park, northern Ambergris Caye, 4 individuals were seen displaying undirected, or even sedentary flight behavior. On October 18, 3 individuals were seen flying south across the Highway between Belize City and Belmopan.

From October 21 and 22 a few individuals were seen far out to sea on Lighthouse Reef and Turneffe Islands. One individual turned up at 2300 h on a light in a boat. The last individuals were 12 moths seen in and near Hopkins in the Stann Creek district on November 7 and 8.

All females collected on August 26 and 30 were dissected and checked for eggs. The abdomen of 6 females contained only fat and no eggs. The abdomen of the remaining 7 females contained between 5 and 80 eggs (mean = 41) varying in diameter from 0.86 mm to 1.17 mm. As far as we



know this is the first record of a mass migration of this species through Belize.

We are not aware of the origin of the *U. fulgens* which passed through. Neither dare we speculate whether the southward traveling moths were the same as the ones that traveled northward earlier. For a more detailed discussion of this problem we refer readers to the paper by Smith (1992).

Papilionoidea

On August 1, 1995, a strong migration involving several butterfly species was noted all over the Stann Creek district. All butterflies were moving in a straight line in a south-southeasterly direction. In Monkey River Village, at the beach, the movement continued across the water. Fishermen reported large numbers of butterflies near the Barrier Reef, 35 km offshore. No doubt the butterflies were crossing the bay and heading for Guatemala/Honduras (100-180 km over water depending on landing site).

It is not clear how, and if the migration continued from there. According to Monkey River Village residents, this movement started in the last week of July. At the Baccalar Chico National Park, a mixed migration was noted from July 15 onwards (Auriol Samos, pers. com.). It is likely that this migration was part of the same movement.

Species involved in the migration included: *Anteos maerula* (large numbers), *Aphrissa boisduvalli* (large numbers), *Aphrissa statira* (moderate numbers), *Marpesia chiron* (low numbers), *Marpesia petreus* (low numbers), *Eunica alcmena* (low numbers), *Historis odius* (low numbers) and *Historis acheronta* (large numbers). The last four species are remarkable because they are not generally known to migrate. Williams (1930) did note that both *Historis* spp. sometimes migrate but that there was no evidence of them setting out across wide expanses of water. The current observation shows that crossing of wide expanses of water can occur after all.

Interestingly, the numbers of *H. acheronta* at BTFS had been building up to unusually high numbers just preced-

ing this migration. After the migration, this species virtually disappeared from my catches and numbers have remained undetectable low since. This migration continued unabated for several days but on August 11, numbers declined dramatically and on August 12 there was no longer any evidence of migration.

It is difficult to provide an estimate of the numbers of butterflies involved in this migration. Most butterflies appeared in small flocks. But, on average, on a random 50 m wide front, anywhere between 5 and 10 butterflies a minute could be seen passing. Over this same 50 m wide front, between 3,000 and 6,000 butterflies would pass daily. The migration lasted at least 11 days which suggests 33,000 - 66,000 butterflies in total. The total width of the migration path is unknown but must have been tens of kilometers wide. Anywhere between 10 and 50 million butterflies may have been on the move during this period.

Hesperiidae

On July 17, 1996, we noted a regular movement of large Hesperidae along the Southern Highway between Hopkins and Dangriga in the Stann Creek district. On the beach near Hopkins, movements were erratic but clearly eastward directed and moving into the sea while the wind was coming from the NE. Since we did not have a net at hand we had difficulty obtaining specimens. Two specimens (that we peeled from the car grille), proved to be the Canna Skipper, *Calpodus ethlius*.

Literature Cited

- Dwyer, D. & D. L. Spellman. 1981. A list of Dicotyledoneae of Belize. *Rhodora* 83(834): 161-236.
- Meerman, J. C. (Ed.) 1995. Monkey River Special Development Area, Toledo district, Belize. Biodiversity study 1995. Belize Tropical Forest Studies Publication #5. 2 vols. 145 pp (86 pp. + 3 app.).
- Smith, N. G. 1992. Reproductive behaviour and ecology of *Urania* (Lepidoptera: Uraniidae) moths and of their larval food plants, *Omphalea* spp. (Euphorbiaceae). In: Quintero, D. & A. Aiello (eds.), *Insects of Panama and Mesoamerica*. Oxford University Press. Oxford. 692 pp.
- Williams, C. B., 1930. The migration of butterflies. Oliver & Boyd, Edinburgh & London. xi+473 pp.