

## Contribution to the Noctuidae fauna of Ethiopia

(Lepidoptera, Noctuidae)

by

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received 22.X.2007

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**Abstract:** The present paper contains the preliminary records of the Noctuidae (Lepidoptera) material collected by light traps in highland Ethiopia (from 2000 m to 3300 m). 118 different taxa belonging to 17 subfamilies were collected and identified at least at generic level. Most of the taxa (95 species, 80.5% of total) belong to five subfamilies: Catocalinae – 32 species (27.1%); Hadeninae – 21 species (17.8%); Noctuinae – 17 species (14.4%); Xyleninae – 15 species (12.7%); and Plusiinae – 10 species (8.5%). Other subfamilies were represented by one to four. Species assemblages were highly different between the collected sites, only three ubiquitous and polyphagous species occurred throughout the entire area of research.

**Introduction:** The territory of Ethiopia is host to extraordinarily diverse landscapes including high mountains, lowlands, deserts and tropical rain forests. According to biogeography classification, it belongs to the East-African subprovince of the Ethiopian biogeographical province (LOPATIN, 1980). The Ethiopian (Abyssinian) upland, with heights exceeding 2000 m above sea level (a.s.l.), is covered by grassland and deciduous woodland, while tropical highland forest occupies the essential part of the country (pic. 1, col. pl. 24, p. 426). The vertical zonality of plants in the Ethiopian Upland was described by MANY (1968) and investigated later in detail by HEDBERG (1971, 1975). Mountain ecosystems include a number of endemic ephemeroïd plant and insect species with restricted local ranges, which occur only at high altitudes (BASILEWSKI, 1962). HEDBERG (1971, 1975) considered the Ethiopian high mountains as a separate biogeographical unit that differs from regular tropical East-

African regions. Moreover, FRANZ (1979) proposed the existence, in the Ethiopian mountains, of two distinct faunas with an ecological border between them at 3000 m (a.s.l.).

Large territories of Ethiopia are used for agriculture and traditional pasturing of livestock. The grazing overload during the past two centuries has resulted in the disappearance of native

Podocarpus and Juniperus forest stands that could not regenerate under overgrazing conditions. Significant areas of arable land have been recently cultivated and local species of cereal (tef), leguminous and fodder crops are now cultivated there.

The beetle fauna of Ethiopia was described by ALLUAUD (1937), MANI (1968), BASILEWSKI (1962, 1974), and FRANZ (1979). Later as a part of the Joint Ethiopian-Russian Biological Expedition (JERBE), soil invertebrates were studied by RYBALOV (1989, 1990, 2000), STRIGANOVA (1975, 1989, 1992), and STRIGANOVA et al. (1995, 2000). The Lepidopteran fauna of Ethiopia have probably been understudied by comparison. For example, only 126 Ethiopian species of Noctuidae – the largest family of Lepidoptera – have been recorded (ROUGEOT, 1977). However, in Israel, 548 species have been recorded (KRAVCHENKO, FIBIGER, HAUSMANN A. & MILLER, 2007a; 2007b), in Greece and Crete there are 591 species (HACKER, 1989), in Azerbaijan there are 663 species (ALIEV, 1984), in Iraq there are 287 species (WILTSHIRE, 1957), and in Saudi Arabia there are 406 recorded species (WILTSHIRE, 1990). The Ethiopian butterflies have probably been much better studied than the Noctuidae. The list of the butterflies, collected mostly by LEONID RYBALOV & LEV MEDVEDEV, presently includes 87 species (GORBUNOV & TUZOV, 2000), but that is no doubt also far from complete.

In this study, we present the identified species of Noctuidae collected in different biotopes of the West Shewa region of Ethiopia from 15 April to 15 May 2007.

**Collecting sites:** The collecting was conducted in the vicinity of Ambo - spa town in central Ethiopia, 120 km west of Addis Ababa (pic. 1). The town is situated in West Shewa that is part of the Oromia region in the western part of the Abyssinian Plateau. Most of the region is comprised of “medium altitudes”, which corresponds to about 2000 m. (a.s.l.).

The meteorological station in Ambo PPRC (Latitude 08° 57'; Longitude 038° 51'; Elevation 2225 m. a.s.l.) receives rainfall from March to September, with the highest rates in July (197 mm) and August (310.7 mm). During this period, maximal daytime temperatures vary from 28.5 °C to 24.3 °C and minimal nighttime temperatures vary from 18.5 °C to 11.5 °C. During driest months, from October to February, the daytime temperatures do not differ essentially from the daytime temperatures of the rainy season, which varies from 26 °C – 30 °C, while the nighttime temperatures drop to between 7 °C and 10 °C. The average relative humidity (RH%) varies during the year from 48.9% to 84.1%. Soil temperatures at a depth of 5 cm vary from 21.1 °C to 26.3 °C.

Altogether, 15 light traps were operated in four areas at different altitudes and within different soil and vegetation types.

Site 1. The Tel-tele Park in Canyon of Huluka River about 5 km from Ambo (pic. 2, col. pl. 23, p. 425). The bottom of the canyon is situated at about 1800 m (a.s.l), while upper parts of its slopes are at 2000 m (a.s.l). The slopes are covered by scattered bushes and trees on eutrophic cambisol with rich grass vegetation that is watered in the upper part by a few streams that form waterfalls.

Site 2. This site is in the vicinity of the Ambo Agricultural Station. Generally, it is an anthropogenous savanna on Vertisols at about 2000 m. a.s.l. The anthropogenic savanna is characterized by complex plant cover including scrubs of *Euclea*, *Carissa* and grassland plots. There are also some *Podocarpus* trees, different species of *Acacia*, tree-like junipers (*Juniperus procera*), John's-worts *Hypericum* and spurges *Euphorbia*.

Site 3. This site consists of secondary forest on red – brown eutrophic soil 9 km west of Ambo. The dominant trees of the former forest were *Podocarpus* and *Juniperus*. Site 3 is located about 2500 m. a.s.l.

Site 4. is located on the slopes of Wenchi crater, about 3000 m. a.s.l. (pic. 2). The lower parts of the slopes are occupied by tall forests on ferralsol soils, which are replaced by bush species such as heather (*Erica arborea*) that forms dense undergrowth up to a height 180 cm and by the tree-like heather *Erica trinura*. The heather undergrowth is replaced by short-grass alpine meadows at higher levels and alpine cushion formations on alpine rendzina near the mountain top (about 3300 m a.s.l.).

**Results and discussion:** Due to a general lack of knowledge about the Lepidoptera of Ethiopia, the taxonomic positions of some identified species are doubtful. Some of the species are shown on pic. 3 (col. pl. 25, p. 427). In many cases, the only option was to identify specimens only to the genus level. The provisional list of identified material (table 1, p. 388-390) includes 118 species belonging to 17 subfamilies.

Table 2. Number of species per subfamily per site.

Subfamily	Sum of species	Tel-tele	Ambo	Secondary forest	Wenchi
Catocalinae	32	29	12		
Hadeninae	21		6	18	2
Noctuidae	17	12	16	8	2
Xyleninae	15	11	13	4	
Plusiinae	10	8	8	4	1
Heliotinae	4	2	2	1	3
Cucullinae	3		3		
Eublemminae	3	2	3		
Eustrotiinae	3	3	3	1	
Calpinae	2	2			
Sarothripinae	2	2	2		
Bagisarinae	1		1		
Condicinae	1	1	1	1	
Ctenuchidae	1	1	1		
Euteliinae	1		1		
Eariadinae	1	1			
Eriopinae	1		1		
Total	118	74	73	37	8

Table 1. List of identified species and their distribution between the different sites (+ presence)

Species	Tel-tele	Ambo	Secondary forest	Wenchi
Subfamily Bagisarinae				
<i>Xanthodes</i> sp. 1		+		
Subfamily Calpinae				
<i>Ericeia</i> sp. 1	+			
<i>Oraesia</i> sp. 1	+			
Subfamily Catocalinae				
<i>Achaea monodi</i> Laporte	+			
<i>Amyna octo</i> (Guenée, 1852)	+			
<i>Amyna punctum</i> (Fabricius)	+			
<i>Anomis flava</i> (Fabricius)	+	+		
<i>Anomis involuta</i> (Walker)	+			
<i>Anomis sabulifera</i> (Guenée)	+			
<i>Antarchea</i> sp. 1		+		
<i>Audea</i> sp. 1		+		
<i>Blasticorhinus</i> sp. 1	+			
<i>Calpe provocans</i> Walker	+			
<i>Cuneisigna</i> sp.	+	+		
<i>Dugaria mendax</i> (Walker)	+			
<i>Dysgonia torrida</i> (Guenée)	+			
<i>Entomogramma pardus</i> Guenée	+			
<i>Grammodes stolidus</i> (Fabricius)	+			
<i>Heteropalpia</i> sp. 1	+	+		
<i>Hypocala deflorata</i> (Fabricius)	+			
<i>Hypocala</i> sp.	+			
<i>Hypotacha maculifera</i> (Staudinger)		+		
<i>Hypotacha</i> sp. 1		+		
<i>Lacera alope</i> (Cramer)	+			
<i>Mocis frugalis</i> Fabricius	+			
<i>Mocis</i> sp. 1	+	+		
<i>Ophiusa tirhaca</i> (Cramer)	+			
<i>Pandesma robusta</i> (Walker)	+	+		
<i>Pantylidia dufayi</i> Laporte	+	+		
<i>Serrodus partita</i> (Fabricius)	+			
<i>Tathorhynchus philbyi</i> Wiltshire	+	+		
<i>Trichanua mejanesi</i> Guenée	+			
<i>Trigonodes hyppasia</i> (Cramer)	+			
<i>Trigonodes hyppasia</i> (Cramer)	+	+		
<i>Ulotrichopus</i> sp.	+			
Subfamily Condicinae				
<i>Condica capensis</i> (Guenée)	+	+	+	
Subfamily Ctenuchidae				
<i>Rhanidophora</i> sp.	+	+		
Subfamily Cuculliinae				
( <i>Oncocnemidini</i> ) Genus sp.		+		
<i>Cucullia brunnea</i> Walker		+		
<i>Cucullia chrysota</i> Hampson		+		

Subfamily Eubleminae				
<i>Eublemma</i> sp. 1	+	+		
<i>Eustrotia</i> sp. 1		+		
<i>Odice</i> sp. 1	+	+		
Subfamily Eustrotiinae				
Genus sp. 1	+	+		
<i>Ozarba corniculans</i> Wallengren	+	+	+	
<i>Ozarba</i> sp. 1	+	+		
Subfamily Euteliinae				
<i>Paectes</i> sp. 1		+		
Subfamily Eariadinae				
<i>Eurias biplaga</i> Walker	+	+		
Subfamily Eriopinae				
<i>Callopietria latreillei</i> (Duponchel)	+	+	+	
Subfamily Hadeninae				
<i>Acrapex</i> sp. 1		+		
<i>Actinotia</i> sp. 1		+	+	
<i>Aospasta</i> sp. 1			+	
<i>Aospasta</i> sp. 2			+	
<i>Brithys</i> sp. 1			+	
<i>Cetola pulchra</i> Bethune-Baker		+	+	
<i>Felintopsis</i> sp. 1		+	+	
<i>Leucasidia</i> sp. 1			+	
<i>Leuicamia</i> sp. 1				+
<i>Leuicamia venustissima</i> Laporte				+
<i>Mythimna larseni</i> Wiltshire		+	+	
<i>Mythimna socotrensis</i> Jordan		+	+	
<i>Mythimna</i> sp. 1			+	
<i>Mythimna</i> sp. 2			+	
<i>Mythimna</i> sp. 3			+	
<i>Mythimna</i> sp. 4			+	
<i>Mythimna</i> sp. 5			+	
<i>Mythimna</i> sp. 6			+	
<i>Tycomarptes</i> sp. 1			+	
<i>Tycomarptes</i> sp. 2			+	
<i>Tycomarptes</i> sp. 3			+	
Subfamily Heliothinae				
<i>Heliothis armigera</i> Hübner	+	+	+	+
<i>Heliothis batuense</i> Rougeot	+	+		
<i>Heliothis magdaleneae</i> Laporte				+
<i>Heliothis tedjicolora</i> Rougeot				+
Subfamily Noctuidae				
<i>Agrotis ipsilon</i> (Hufnagel)	+	+	+	+
<i>Agrotis longidentifera</i> (Hampson)	+	+		
<i>Agrotis segetum</i> (D. & Schif.)	+	+	+	+
<i>Agrotis</i> sp. 1	+	+		
<i>Agrotis spinifera</i> (Hübner)	+	+	+	
<i>Amazonides</i> sp. 1	+	+	+	
<i>Amazonides</i> sp. 2		+	+	
<i>Amazonides</i> sp. 3		+	+	

<i>Amazonides</i> sp. 4	+	+		
<i>Mentaxya albifrons</i> (Geyer)	+	+		
<i>Mentaxya ignicollis</i> (Walker)	+	+		
<i>Mentaxya</i> sp. 1		+		
<i>Mentaxya</i> sp. 2		+		
<i>Mentaxya</i> sp. 3	+	+	+	
<i>Mentaxya</i> sp. 4	+	+	+	
<i>Mentaxya</i> sp. 5		+		
<i>Ochroleura leucogaster</i> (Freyer)	+			
Subfamily Plusiinae				
<i>Abrostola rougeoti</i> Duffay			+	+
<i>Autographa gamma</i> (Linnaeus)	+	+	+	
<i>Cornutiplusia circumflexa</i> (Linnaeus)	+	+	+	
<i>Ctenoplusia fracta</i> Walker	+	+	+	
<i>Ctenoplusia limbirena</i> Guenee	+	+		
<i>Ctenoplusia ogovana</i> Holland	+			
<i>Ctenoplusia phocea</i> Hampson	+	+		
<i>Thysanoplusia indicator</i> Guenee	+	+		
<i>Thysanoplusia rostrata</i> Fletcher		+		
<i>Trichoplusia chalcona</i> Hampson	+	+		
Subfamily Sarrothripinae				
<i>Characoma</i> sp. 1	+	+		
<i>Characoma</i> sp. 2	+	+		
Subfamily Xyleninae				
<i>Athetis carayoni</i> Rougeot		+		
<i>Brevipecten</i> sp. 1		+		
<i>Busseola fusca</i> (Fuller)	+	+	+	
<i>Caradrina</i> sp. 1		+		
<i>Caradrina</i> sp. 2		+		
<i>Chasmina tibialis</i> (Fabricius)	+			
<i>Conservula cinisigna</i> Joannis	+	+		
<i>Sesamia (submarginata)</i> sp. 1	+			
<i>Spodoptera apertura</i> (Walker)	+	+	+	
<i>Spodoptera exempta</i> (Walker)	+	+	+	
<i>Spodoptera exigua</i> (Hübner)	+	+	+	
<i>Spodoptera littoralis</i> (Boisduval)	+	+		
<i>Spodoptera mauritia</i> (Boisduval)	+	+		
<i>Spodoptera pecten</i> Guenée	+	+		
<i>Spodoptera</i> sp. 1	+	+		

Most of the species (95 species, 80.5% of total) belong to five subfamilies (table 2, p. 387): Catocalinae – 32 species (27.1%); Hadeninae – 21 species (17.8%); Noctuidae – 17 species (14.4%); Xyleninae – 15 species (12.7%); and Plusiinae – 10 species (8.5%). Other subfamilies are represented by one to four.

About half of the species (61 of 118) were collected only in one site, 40 species shared two sites, 14 species were found in three sites and only three species occurred throughout the entire area of research. These three species are the African Bollworm (*Heliothis armigera* HÜBNER), the Greasy Cutworm (*Agrotis ipsilon* HUFNAGEL) and the Turnip Moth (*Agrotis segetum* D. & SCHIF.) which is a well-known ubiquitous species that develops on a wide range of wild and agricultural plants (KRAVCHENKO et al., 2007b). In Africa they damage cotton, maize, tomatoes, beans, sorghum and other plants (ABATE & AMPOFO, 1996).

Most of the Catocalinae species (29 of 32, table 2) occurred in the Tel-tele Park (Canyon of Huluka River). Among the Catocalinae, 20 species were collected only in the Tel-tele Park, nine species occurred both in the Tel-tele and in the vicinity of the Ambo Agricultural Station, and three species (one *Antarchea* sp., one *Hypotacha* sp. and *Hypotacha maculifera* STAUDINGER) were found only in the vicinity of Ambo. The larvae of the species probably develop on *Acacia*. Most of the „Tel-tele“ species are wide spread tropical species including some well-known pest of tropical fruits; piercing moths (like species of the genus *Anomis*). None of the Catocalinae species were collected in sites of higher elevation (secondary forest ~ 2500 m. a.s.l. and Wenchi crater ~ 3000 m. a.s.l.).

The majority of the Hadeninae species (18 of 21, table 2, p. 387) occurred at the station located in secondary forest. Thirteen species were found only at this station, five species were also found in the vicinity of Ambo, one species (*Acrapex* sp.) occurred only in the vicinity of Ambo and two species of the genus *Leumicamia* (one *Leumicamia* sp. and *L. venustissima* LAPORTE) were found only at ~ 3000 m a.s.l. (Wenchi crater).

Most Noctuidae species were wide spread throughout the area. Only four species were unique to one of the stations. The wide spread Afrotropical, polyphagous *Ochropleura leucogaster* (FREYER) were found only in the Canyon of the Huluka River, while three unidentified species of the genus *Mentaxia* occurred only in the vicinity of Ambo.

The 15 species of *Xyleninae*, including the well-known pest of maize - *Busseola fusca* FULLER, and seven species of the genus *Spodoptera* (usually polyphagous on low grasses), were wide spread on „medium“ elevations avoiding altitudes of ~ 3000 m a.s.l. Four species were found only in the vicinity of Ambo, while *Chasmina tibialis* (FABRICIUS) and one *Sesamia* (?*submarginata*) sp. were recorded only in Tel-tele Park.

Among 10 Plusiinae species, nine were wide spread on „medium“ elevations avoiding altitudes of ~ 3000 m a.s.l., but *Abrostola rougeoti* DUFFAY occurred mostly in Wenchi crater at ~ 3000 m a.s.l. Among the Heliothinae, represented by four species, two species (*H. magdalenae* LAPORTE and *H. tedjicolora* ROUGEOT) were found only in the higher elevations of Wenchi crater. All three Cuculliinae species were collected only in the vicinity of Ambo.

**Acknowledgement:** The authors wish to thank Dr. GURJA BELAY, the Head of the Biological Department of AAU, Dr. ANDREY DARKOV, Russian Coordinator of the Joint Ethio-Russian Biological Expedition (JERBE) and many generous Ethiopian citizens.

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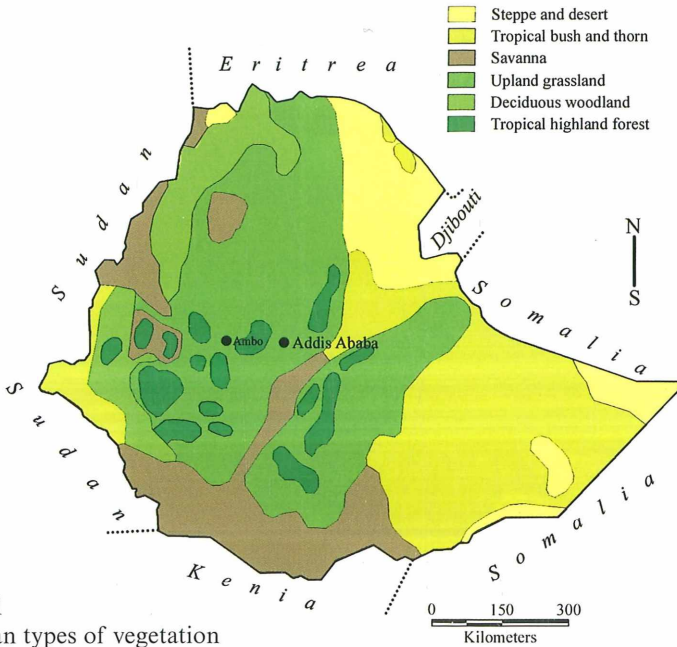
## Colour plate 23



Picture 2. Canyon of Huluka river: 1 – vulture on top of tee, 2 – view of the canyon with waterfall, 3 – tributary stream; Wenchi crater: 4 – forest of Abyssinian endemic tree (*Hagenia abyssinica*) 5 endemic Abyssinian heather (*Erica arborea*).

## Colour plate 24

### Ethiopian types of vegetation



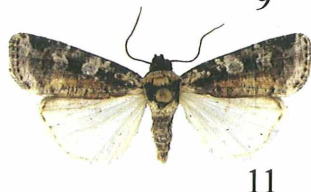
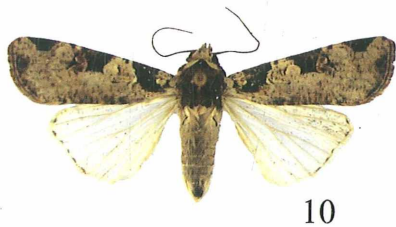
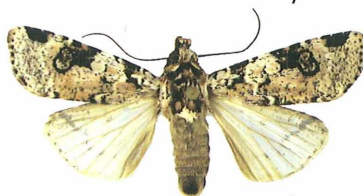
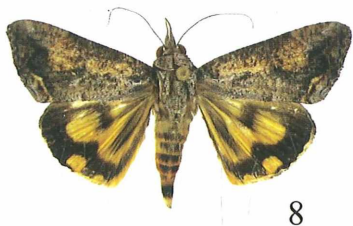
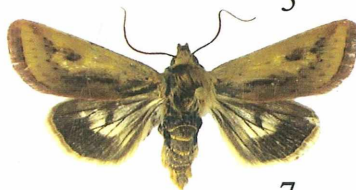
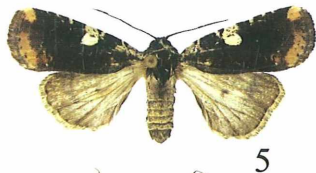
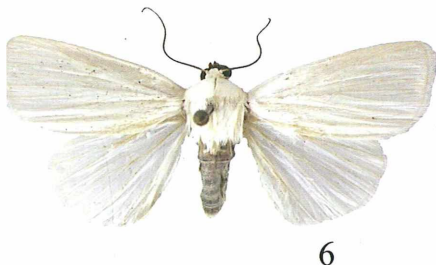
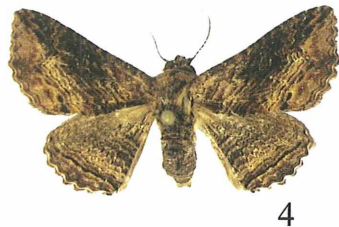
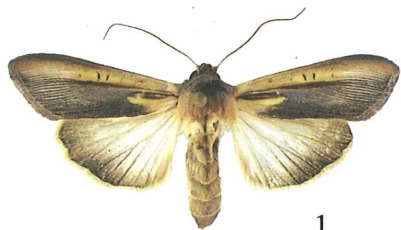
Picture 1  
Ethiopian types of vegetation

Picture 3, colour plate 25, p. 427

Some of the collected Noctuidae species.

- 1: *Cucullia chrysota* HAMPSON. Ethiopia: West Shewa, 2200 m, Ambo, V.2007.
- 2: *Heliothis magdalenae* LAPORTE. Ethiopia: West Shewa, 3300 m, Wenchi Crater, V.2007.
- 3: *Heliothis tedjicolora* ROUGEOT. Ethiopia: West Shewa, 3300 m, Wenchi Crater, V.2007.
- 4: *Dugaria mendax* (WALKER). Ethiopia: West Shewa, 2200 m, Ambo, V.2007.
- 5: *Euxootera mauricei* LAPORTE. Ethiopia: West Shewa, 3300 m, Wenchi Crater, V.2007.
- 6: *Chasmina tibialis* (FABRICIUS). Ethiopia: West Shewa, 2000 m, Tel-tele Park, V.2007.
- 7: *Heliothis batuense* ROUGEOT. Ethiopia: West Shewa, 2200 m, Ambo, V.2007.
- 8: *Hypocala deflorata* (FABRICIUS). Ethiopia: West Shewa, 2000 m, Tel-tele Park, V.2007.
- 9: *Mentaxya albifrons* (GEYER). Ethiopia: West Shewa, 2200 m, Ambo, V.2007.
- 10: *Mentaxya ignicollis* (WALKER). Ethiopia: West Shewa, 2200 m, Ambo, V.2007.
- 11: *Hoplodrina* spec. Ethiopia: West Shewa, 2000 m, Tel-tele Park, V.2007.

# Colour plate 25



# ZOBODAT - [www.zobodat.at](http://www.zobodat.at)

Zoologisch-Botanische Datenbank/Zoological-Botanical Database

Digitale Literatur/Digital Literature

Zeitschrift/Journal: [Atalanta](#)

Jahr/Year: 2007

Band/Volume: [38](#)

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