

# The Gelechiidae (Lepidoptera) in the collection of the State Museum of Natural History, Karlsruhe (SMNK)

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## Kurzfassung

Die Gelechiidae des SMNK wurden kuratiert und in einer Hauptsammlung neu angeordnet: In 91 Insektenkästen wurden ungefähr 35.000 Exemplare in mehr als 800 Arten geordnet. Dies ist das Ergebnis der Integration mehrerer separater Sammlungen sowie unsortierter Exemplare. Mit 125 Primärtypen (Holo- und Lectotypen) und einer beträchtlichen Anzahl von Exemplaren aus schlecht untersuchten Regionen ist die Gelechiidae-Sammlung des SMNK eine der artenreichsten Sammlungen dieser Familie weltweit. Das Material aus der Sammlung wird häufig in aktuellen taxonomischen Revisionen der Gelechiidae verwendet. Die Geschichte der Sammlung wird kurz besprochen.

## Abstract

The Gelechiidae of the SMNK were curated and rearranged in a main collection: approximately 35,000 specimens of more than 800 species have been arranged in 91 drawers. This is the result of the integration of several separate collections as well as unsorted specimens. With 125 primary types (holotypes and lectotypes) and a considerable number of specimens from poorly studied regions, the Gelechiidae collection of the SMNK is one of the most species-rich collections of this family worldwide. The material from the collection is frequently used in recent taxonomic revisions of Gelechiidae. The history of the collection is briefly discussed.

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With more than 800 species and about 35,000 specimens the collection of Gelechiidae at the SMNK is the largest within Germany and one of the most representative for this family not only in Europe but worldwide. For decades, the gelechiids were stored in separate collections, but recently they have been rearranged to form an up-to-date systematical depository. The collec-

tion comprises extensive material representing the faunas of Germany and Europe, as well as other areas of the Palaearctic. The Oriental and Neotropical regions, however, are only poorly represented.

The fauna of Germany is represented mainly by collections of KARL STROBEL (inventory number E-Lep. 26), HANS WAGNER (E-Lep. 27), HANS VON TÜRCKHEIM (E-Lep. 15), GUSTAV REICH (E-Lep. 5), HELMUT STEUER (exchange material with other collectors), ALOIS GREMMINGER (E-Lep. 3), and others. For the history and the inventory numbers E-Lep. 1-202 of the SMNK's Lepidoptera collection see the publications by EBERT (1964, 1977, 2004) and TRUSCH (in prep., E-Lep. 203 onwards). The majority of this particular material has been collected before World War II in Southwest and East Germany, i.e. the area of Karlsruhe and Berlin, as well as in Bavaria and other areas of Germany. The important historical collections of CARL REUTTI (E-Lep. 12), ADOLF MEESS (E-Lep. 9) and HERMANN LIENIG (E-Lep. 28) are more representative. They comprise not only material from Germany but also from France, Spain, and Italy, as well as from the Alps and other regions of South and Southwest Europe. The most significant part of the Gelechiidae collection of the SMNK with great scientific value is represented by material originating from the collections of HANS GEORG AMSEL (beside his pre-war collections the inventory numbers E-Lep. 47, 48, 113), KARL BURMANN (E-Lep. 304), and WOLFGANG GLASER (no inventory number by R.-U. ROESLER).

The well-known German lepidopterist H. G. AMSEL curated the Lepidoptera collection at the SMNK from 1955 to 1973. Prior to this, AMSEL has been an employee of the Übersee-Museum Bremen (= Städtisches Museum für Natur-, Völker- und Handelskunde 1896-1933, Staatliches Museum für Natur-, Völker- und Handelskunde 1933-1935, Deutsches Kolonial und Übersee-Museum Bremen 1935-1951) from 1934 until after the end of World War II 1946, and brought parts of his collection to Karlsruhe after moving to this city.

The Gelechiidae of his collection comprises material from the Middle East including a number of type specimens of taxa described by AMSEL in his faunistic and systematic papers on Gelechiidae from Palestine. It also includes rather extensive material including several type specimens of taxa described based on material collected in Sardinia: *Epidola grisea* AMSEL, 1942, *E. nuraghella* HARTIG, 1939, *Metzneria santolinella* (AMSEL, 1936), *Neofaculta ericitella tenalella* (AMSEL, 1938), Malta: *Epidola melitensis* AMSEL, 1955, and Northern Germany: *Neofaculta ericitella atlanticella* (AMSEL, 1938). This collection was later considerably supplemented by very rich material collected by AMSEL himself and other collectors in Iran, Afghanistan, Saudi Arabia, Spain, the Alps and other regions of Europe and Asia.

Later, the SMNK-collection was greatly extended by the incorporation of the extraordinary species- and specimen-rich collections of KARL BURMANN, WOLFGANG GLASER, and REINHARD SUTTER (E-Lep. 205). These collections could be obtained for the SMNK thanks to the managerial skills and personal efforts of both, the curators of Lepidoptera and directors of SMNK.

The collection of the well-known Austrian lepidopterist KARL BURMANN was acquired by the SMNK in 1968. This acquisition can hardly be overestimated, because the collection comprises extensive material from Austrian Tyrol documenting the Alpine fauna of this region. The collection is of excellent quality and contains types of several species, e.g. *Sattleria dzieduszyckii fusca* BURMANN, 1954 or *Anarsia burmanni* AMSEL, 1958, a subjective synonym of *Anarsia bilbainella* (RÖSSLER, 1877). Moreover, the collection includes material collected by W. GLASER in Spain and Turkey including many type specimens of Gnorimoschemini described by DALIBOR POVOLNÝ: *Scrobipalpa bryophiloides* POVOLNÝ, 1966, *S. occulta* (POVOLNÝ, 2002), *S. anatolica* POVOLNÝ, 1973, *S. chetitica* POVOLNÝ, 1974, *Turkopalpa glaseri* POVOLNÝ, 1973, and others.

Until 2019 most other specimens of Gelechiidae from the collection of WOLFGANG GLASER were kept unsorted among other Microlepidoptera collected by W. GLASER himself or with the help of his wife and field collaborator MARGIT in Austria, Spain, Crete, Turkey and Tunisia ("Mauritania, Tunisia-Süd") (Fig.1). Apart from the large number of individual specimens, the GLASER's collection contains valuable data on larval host plants. For some species, e.g. *Caulastrocecis cryptoxena* (GOZMÁNY, 1952), several species of *Scrobipalpa* and others



Figure 1. A series of *Sclerocecis pulverosella* CHRÉTIEN, 1908 from Tunisia. – All photos: OLEKSIY V. BIDZILYA.

it is the only source of biological information. Since 2020, this material is incorporated into the main collection of Gelechiidae, along with thousands of previously unidentified specimens collected by H. AMSEL, G. EBERT, E. DIEHL, J. KLAPPERICH (E-Lep. 20, 21, 79), R. PINKER (E-Lep. 17, 19), W. BENDER (E-Lep. 32, 33, 197), U. ROESLER (E-Lep. 46, 52, 102, 124, 145, 156), F. HAHN (E-Lep. 283), and other collectors in Spain (including the Canary Islands), the Balkan peninsula, Central Asia (Iran, Afghanistan, Pakistan), Turkey, Middle East (Jordan, Saudi Arabia), and Northern Africa (Tunisia, Morocco). Most of them are now identified to species level, though a number of specimens from unrevised groups are arranged by morphotypes awaiting further study.

Recently the Gelechiidae at the SMNK were supplemented by specimens from the collection of REINHARD SUTTER. Most of them are of outstanding quality, being excellently labeled and prepared (Fig. 2). This collection comprises many in-



Figure 2. *Scrobipalpa camphorosmella* NEL, 1999 from the collection of REINHARD SUTTER, which is part of the SMNK collection (Inv.-No. E-Lep. 205).

interesting and scientifically important specimens from Crete and other Greek islands. There is also some material from Greece, the Czech Republic (Bohemia) and Hungary. The identification of many species from taxonomically difficult groups or cryptic species has been confirmed by the study of the genitalia. Some specimens of *Monochroa*, *Ivanauskiella*, *Ptocheuusa*, and other genera of Anomologini from Greece are currently under study, and we expect to find additional new species among them.

One can conclude that the SMNK holds one of the richest collections of Gelechiidae from Afghanistan, Iran and the Middle East (Palestine, Jordan, Saudi Arabia). The faunas of Spain (in-

cluding Canary Islands) and the Austrian Alps are also well represented. Quite rich material from Crete, Turkey and North Africa (Tunisia) is available for further scientific studies. However, only few and random specimens are available from Eastern Europe, Russia and China. Gelechiidae from South Asia are represented by comparatively rich material from Indonesia (Sumatra) collected by R.-U. ROESLER & P. V. KÜPPERS, and E. DIEHL. The preliminary study of these specimens led to the identification of several as yet undescribed species of *Anarsia*, *Hypatima* and other related genera of Chelariini as well as of species of Gelechiini (Fig. 3). Neotropical Gelechiidae are represented by six species of Gnorimoschemini from Ecuador, Colombia, the Dominican Republic, and Costa Rica (Fig. 4). These are *Tuta absoluta* (MEYRICK, 1917), *Eurysacca media* POVOLNÝ, 1986, *Keiferia colombiana* POVOLNÝ, 1975 (paratypes), *Keiferia lycopersicella* (WALSINGHAM, 1897), *Tecia solanivora* (POVOLNÝ, 1973) (type series) and *Tecia venosa* (BUTLER, 1883) (holotype of *Holococera baccharisella* BRETHÉS, 1917).

Currently the SMNK collection of Gelechiidae comprises approximately 35,000 specimens of more than 800 species in 91 drawers (Fig. 5). The type material includes 125 primary types (holotypes and lectotypes) and 105 paratypes. Most of them are types of Gnorimoschemini described by DALIBOR POVOLNÝ based on material loaned from AMSEL'S, GLASER'S and BURMANN'S collections (Fig. 6). These specimens were returned to SMNK from the Moravian Museum, Brno, Czech Republic in 2011. Furthermore, the SMNK holds several paratypes of Gnorimoschemini described by POVOLNÝ from material collected by F. KASY & E.



Figure 3. *Chelariini* from Sumatra are still awaiting study.



Figure 4. Type series of *Tecia solanivora* POVOĽNÝ, 1973. – one of several Neotropical species of Gelechiidae in the collection of the SMNK.



Figure 5. Approximately 35,000 specimens of Gelechiidae are currently arranged in 91 drawers in the SMNK collection.

VARTIAN in Iran and Afghanistan, by J. KLIMESCH in the Canary Islands, and by E. ARENBERGER in Turkey. Paratypes collected by Z. KASZAB in Mongolia for the Natural History of Budapest are currently kept in SMNK as well. Most type specimens of the taxa described by H. AMSEL from material collected by himself are deposited at the SMNK (Fig. 7). This is also true for most of types initially stored at the Übersee-Museum Bremen, which were transferred partly with the AMSEL collection of Gelechiidae to the SMNK after World War II (K. SATTLER, pers. comm., B. VON BRISKORN and V. LOHMANN, pers. comm.). The SMNK also holds several paratypes of taxa described by T. WALSINGHAM and P. CHRETIÉN from Northern Africa, which were received in exchange from the Natural History

Museum London, which is confirmed by corresponding labels. Some type specimens of *Ornativalva* species described by K. SATTLER (1967) as well as types of many recently described species of *Bryotropha* (KARSHOLT & RUTTEN 2005) are also stored at the SMNK.

For years the collection served as the basis for many taxonomic and faunistic publications, including several of outstanding scientific value. H. AMSEL published his pioneering papers on the Lepidoptera of Palestine (AMSEL 1933, 1935 a,b,c and others) based on material now stored at the SMNK. Later, AMSEL's material was incorporated in a series of generic revisions (e. g. SATTLER 1967, 1976, PITKIN 1984, KARSHOLT & RUTTEN 2005 and others). Numerous papers by D. POVOĽNÝ on





Figure 6. Part of the type-series of *Scrobipalpa halophila* POVOLNÝ, 1973. The species was described based on a long series of specimens collected by WOLFGANG and MARGIT GLASER in Turkey.

Palaeartic Gnorimoschemini were based fully or in part on material collected by H. AMSEL and W. GLASER.

Permanent slides of dissected genitalia of Gelechiidae are arranged in alphabetical order by the authors' names. All slides are databased in regularly updated Excel data-sheets, which greatly facilitates the search for particular slides.

The collection of Gelechiidae has been extensively studied and serves as basis for modern taxonomic revisions and for regional lists of Palaearctic Gelechiidae (BIDZILYA & MEY 2018, BIDZILYA & NUPPONEN 2018, HUEMER & KARSHOLT 2018, BID-

ZILYA et al. 2019, BIDZILYA & KARSHOLT 2018, 2019). As a result, the number of identified species including types of newly described species in the collection of SMNK is continuously increasing. This illustrates the outstanding scientific value of the collection. The Gelechiidae collection of the SMNK comprises representative material – rich in both specimens and species – from regions which are now hardly accessible for collecting activities due to their permanently unstable political situation. This is another aspect which stresses the high scientific value of the collection of Gelechiidae of the SMNK and which makes this collection a valuable basis for further contributions to the systematics of Gelechiidae by future generations of taxonomists.

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Figure 7. Species of the genus *Anarsia* with long series of type-specimens of *A. geminella* AMSEL, 1967.

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