

Review

Ecology, Distribution, and Conservation Considerations of the Oak-Associated Moth *Dioszeghyana schmidtii* (Lepidoptera: Noctuidae)

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Abstract

The noctuid moth *Dioszeghyana schmidtii* (Dioszeghy, 1935) is a geographically restricted and poorly known species associated with xerothermic oak ecosystems of Central, Eastern, and Southeastern Europe and Asia Minor. Despite its inclusion in European conservation frameworks, information on its distribution, biology, and ecological requirements remains fragmented, regionally uneven, and scattered across the faunistic literature in multiple languages. This review synthesizes published records, taxonomic sources, ecological observations, and curated occurrence data to provide an updated and critically assessed overview of the species' biology, habitat associations, and biogeographic pattern. Distributional information was compiled exclusively from the literature and vetted public databases, with mapped occurrences representing confirmed regional presence rather than fine-scale occupancy. The species exhibits a patchy but ecologically coherent distribution closely linked to open, thermophilous *Quercus* woodlands, particularly those dominated by *Q. cerris* and related oak species. Major threats include habitat loss, forest densification, fragmentation, and phenological mismatches associated with climate change. By identifying persistent knowledge gaps and sources of uncertainty, this review highlights priorities for future research, monitoring, and habitat-based conservation of *D. schmidtii* and similar early-spring, oak-associated Lepidoptera.

Keywords: Lepidoptera; Noctuidae; thermophilous oak woodlands; early-spring moths; habitat associations; European moth fauna; European biodiversity; Natura 2000

1. Introduction

Lepidoptera constitute one of the most diverse and ecologically important insect groups in Europe, occupying a wide range of habitats and playing key roles in terrestrial ecosystems. Many species exhibit strong associations with particular vegetation types or microclimatic conditions, making them sensitive indicators of environmental change and habitat quality [1–3]. As a result, Lepidoptera have been widely used in biodiversity monitoring and conservation assessments, especially in forest and grassland ecosystems undergoing rapid land-use change [4–6].

Despite increasing awareness of large-scale declines in insect abundance and diversity, knowledge remains unevenly distributed among taxa. While widespread or economically important species are often well studied, many habitat-specialist or geographically restricted moths remain poorly documented. This knowledge gap is particularly pronounced



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for geographically restricted or low-density species whose distributions are centered in Central, Eastern, and Southeastern Europe, where faunistic data are often fragmented, unevenly accessible, and underrepresented in international syntheses [7,8]. For such taxa, available information is often fragmented across regional faunistic publications, local journals, and the grey literature, frequently published in national languages and with limited circulation. The absence of accessible syntheses complicates comparative biodiversity analyses, limits the integration of these species into broader ecological and conservation frameworks, and hampers the evaluation of their conservation status at national and continental scales.

The noctuid moth *Dioszeghyana schmidtii* (Dioszeghy, 1935), commonly known as the Hungarian Quaker, exemplifies this pattern. The species has a fragmented distribution across parts of the Balkans, Central–Eastern Europe, and Asia Minor and is generally regarded as rare or highly localized throughout its known range. Although described nearly a century ago, information on its morphology, life history, habitat associations, and distribution remains scattered and uneven in quality. Much of the available information is confined to brief faunistic notes or regional publications, while several taxonomic and ecological observations are available primarily in Hungarian or German sources. In addition, some historical records are ambiguous or lack precise locality data, contributing to uncertainty regarding the true extent of the species' distribution and ecological requirements.

Recent studies have begun to clarify some aspects of the species' ecology, particularly its association with oak species in xerothermic forest habitats [9,10]. These habitats themselves are of high conservation importance in Europe, supporting a diverse assemblage of specialized organisms and facing increasing pressure from land-use change, forest densification, and altered management regimes [11–15]. In this context, *D. schmidtii* represents a potentially informative case for understanding the ecological requirements and conservation challenges of specialist Lepidoptera associated with thermophilous oak systems.

The present study aims to synthesize and critically evaluate the available knowledge on the taxonomy, biology, ecology, and distribution of *D. schmidtii*, aspiring to provide a comprehensive reference for future research. By reviewing both widely accessible and regionally published sources, this paper seeks to (i) clarify contradictory or outdated information, (ii) summarize current understanding of the species' ecological associations, and (iii) identify key knowledge gaps relevant to future research and conservation efforts. Rather than providing an exhaustive natural history, the focus is on assessing the reliability and limitations of existing data and outlining priorities for improving the species' documentation within a broader biodiversity and conservation framework.

2. Scope, Sources, Methods, and Limitations of the Review

This review synthesizes all available published information on *D. schmidtii*, including data on taxonomy, morphology, biology, ecology, distribution, and conservation. Literature was compiled through targeted searches of major bibliographic databases (Web of Science, Google Scholar), complemented by extensive screening of regional entomological journals, faunistic reports, and monographs. Emphasis was placed on Central and Southeastern European sources published in Hungarian, German, Turkish, and English, many of which are poorly accessible internationally. No temporal restriction was applied, and all sources from the original description [16] to the present were considered.

Phenology was reconstructed by synthesizing published collection dates, rearing observations, and life-history descriptions from the literature, and summarized as a schematic decadal timeline reflecting the typical timing of each developmental stage across the species' range.

In addition to the published literature, curated biodiversity databases were consulted to supplement distributional information. Occurrence records from the Global Biodiver-

sity Information Facility (GBIF) were used selectively, restricted to records supported by preserved specimens, photographic vouchers, or institutional datasets. Casual human observations and records lacking verifiable metadata were excluded. All GBIF data used in this study are cited via a persistent DOI [17], ensuring reproducibility and transparency.

To visualize the confirmed distribution of *D. schmidtii*, a distribution map was produced using ArcMap 10.4.1 (ESRI, ArcGIS Desktop). Precise geographic coordinates reported in the literature or associated with museum specimens were plotted directly. For historical records and faunistic reports lacking exact coordinates, approximate point locations were assigned based on the named locality, using the geographic centroid of the settlement or clearly defined geographic feature. In cases where records were linked to protected areas (e.g., Natura 2000 sites), centroid coordinates of the site were used solely for visualization purposes. These georeferenced points represent confirmed presence at the regional scale and are not intended to indicate exact collection sites or fine-scale habitat occupancy.

Given the heterogeneous quality of available data, this review explicitly distinguishes between well-documented observations (e.g., reared larvae, repeated field records) and hypotheses or assumptions that have been repeated in the literature without direct empirical support. No new fieldwork, specimen examination, or molecular analyses were conducted for this study.

Several limitations must be acknowledged. Much of the historical literature reports occurrences only at the level of locality names or broader geographic units, limiting spatial precision. The species' short early-spring flight period, localized populations, and uneven survey effort across regions have likely resulted in chronic under-recording. Consequently, the distribution presented here should be interpreted as a synthesis of confirmed regional presence, rather than as an exhaustive or fine-resolution map of occupied sites. Apparent distribution gaps, particularly in ecologically suitable areas of the Balkans and adjacent regions, are therefore likely to reflect sampling bias rather than true absence.

3. Taxonomic and Morphological Overview

3.1. Taxonomic History and Current Status

D. schmidtii was originally described as *Monima schmidtii* based on material reared from pupae collected near Ineu (then Borosjenő) in western Romania [16]. The original description included brief notes on the egg and early larval stages, although rearing attempts were unsuccessful (Appendix A). The type material was not explicitly designated and is presumed lost, likely destroyed during World War II, a circumstance that has contributed to subsequent taxonomic uncertainty [18].

During the mid-20th century, the species was variously assigned to the genera *Orthosia*, *Parorthosia*, (The subgenus name *Parorthosia* is a *nomen nudum* because it was not published in that year, and the subgenus name *Parorthosia* Rákosy, 1996 is a junior synonym; both are therefore invalid. Rákosy also mistakenly referred to the genus as *Dioszeghyela*) and *Taeniocampa*, reflecting its close external resemblance to early-spring Orthosiini moths such as *Orthosia cruda* and *O. stabilis* [9,19,20]. Several early records were based on misidentified material, and the species remained poorly recognized outside Hungary and adjacent regions [21–23]. Detailed comparative studies of adult genitalia by Hungarian and Romanian authors clarified its distinctiveness and ultimately led to the erection of the monotypic genus *Dioszeghyana* Hreblay, 1993 [24]. In the same work, the subspecies *D. schmidtii* subsp. *pinkeri* was described, highlighting geographic and morphological variation within the species (Appendix B).

At present, *D. schmidtii* is treated as a valid species in a monotypic genus within the tribe Orthosiini (Noctuidae: Noctuinae) (Table 1) [25]. This placement is based primarily on

adult morphological characters, particularly genitalic traits. However, no molecular data are currently available, and the phylogenetic position of *Dioszeghyana* within Orthosiini has not been tested using modern integrative approaches. Consequently, its taxonomic placement should be regarded as provisional, pending molecular and comparative phylogenetic studies.

Table 1. Classification of *Dioszeghyana schmidtii*.

Kingdom Animalia
Phylum Arthropoda
Subphylum Hexapoda
Class Insecta
Order Lepidoptera
Superfamily Noctuoidea
Family Noctuidae
Subfamily Noctuinae
Tribe Orthosiini
Genus <i>Dioszeghyana</i> Hreblay, 1993
Species <i>Dioszeghyana schmidtii</i> (Dioszeghy, 1935)

3.2. Diagnostic Adult Morphology

Adult morphology of *D. schmidtii* has been described in a limited number of classical and regional works, which together provide a consistent picture of a small, compact Orthosiini moth with relatively stable external characters (Figure 1) [16,18,19,26,27].



Figure 1. Adult *Dioszeghyana schmidtii* (Dioszeghy, 1935). Photograph © Kordás Sándor, Hungary; licensed under CC BY 4.0 [28].

The wingspan typically ranges from 23 to 27 mm. The forewings are broad with a rounded apex and a nearly straight outer margin. Ground colour varies from pale grey-yellow to light fawn-brown and is finely dusted, resulting in a smooth and subdued appearance. Transverse lines are weak or partially obsolete, particularly in males. The orbicular and reniform stigmata are well defined and pale-outlined, standing out against the uniform ground colour. The subterminal line is thin, pale, and usually continuous, a feature useful for separation from superficially similar *Orthosia* species.

The hindwings are pale yellowish with a faint rosy tint and a narrow darker marginal band. Sexual dimorphism is weak but present: females tend to be slightly paler and show more distinct transverse markings, whereas males are darker and more uniform in appearance. Male antennae are shortly bipectinate; female antennae are filiform.

Externally, *D. schmidtii* most closely resembles *Orthosia cruda* and *O. stabilis*, but it can generally be distinguished by its smaller size, smoother forewing pattern, paler coloration, and less toothed subterminal line. Reliable identification, however, often requires examination of the genitalia.

3.3. Genitalic Characters

Male and female genitalia provide the most robust diagnostic characters separating *Dioszeghyana* from related genera. The male genitalia are characterized by a short, broad uncus; constricted valvae with a narrow neck; and a long, rounded cucullus. The harpa is broad at the base and pointed apically, and the ampulla is robust and flattened. The ae-deagus bears a single elongate cornutus. In females, the genitalia are distinguished by a short ductus bursae and an elongate corpus bursae lacking a signum. For detailed genital morphology, readers are referred to the original illustrations provided by Căpușe, Rákosy and Beshkov [9,19,29].

Multiple authors have consistently cited these characters as justification for maintaining *Dioszeghyana* as a distinct genus. Nonetheless, in the absence of molecular evidence, the extent to which these traits reflect deep phylogenetic divergence rather than morphological specialization within Orthosiini remains unresolved.

3.4. Immature Stages

Knowledge of the immature stages of *D. schmidtii* is derived from a small number of rearing observations and descriptive studies (Appendix C) [10,16,18,19,26,30]. Eggs are similar in size and general morphology to those of *O. cruda*, differing only in subtle chorionic features that are unlikely to be diagnostic under field conditions.

Larvae are more distinctive (Figure 2). From the second instar onward, they exhibit a characteristic dark grey ground colour with a lemon-yellow dorsal line and a greenish-yellow ventral surface, sharply demarcated from the dorsal zone. The head capsule shows a complex and stable pattern of dark markings, and the pinacula are small, dark, and finely ringed. These traits allow separation from larvae of sympatric *Orthosia* species, particularly *O. cruda* and *O. cerasi*, which differ in dorsal patterning and head markings. Comparative studies suggest the closest resemblance is to *O. miniosa*, another oak-feeding species, though consistent differences in dorsal markings and body pattern are present [10].

The pupal stage has not been formally described. Available observations indicate that pupation occurs in compact earthen cocoons at depths of approximately 10–15 cm, similar to other Orthosiini. Detailed morphological documentation of the pupa is lacking and represents a clear gap in current knowledge.



Figure 2. Larva of *D. schmidtii* (photo © A. Tsikas).

4. Biology and Ecology

4.1. Phenology and Voltinism

D. schmidtii is a univoltine species with a flight period restricted to early spring. Across its range, adults are typically recorded from mid-March to early April, with minor regional variation depending on altitude and local climatic conditions (Figure 3) [30–32]. Based on the results of research in Hungary, the start of the main flight period coincides with the beginning of the Blackthorn (*Prunus spinosa*) bloom. The peak of the main flight period is observed in the period when the Blackthorn is still blooming but also has already withered branches, the Hawthorn (*Crataegus* spp.) still only has green flower buds, but the Wild Pear (*Pyrus pyraister*) is already blooming [33]. Records from southern parts of the range tend to precede those from Central and Eastern Europe, consistent with latitudinal temperature gradients [33].

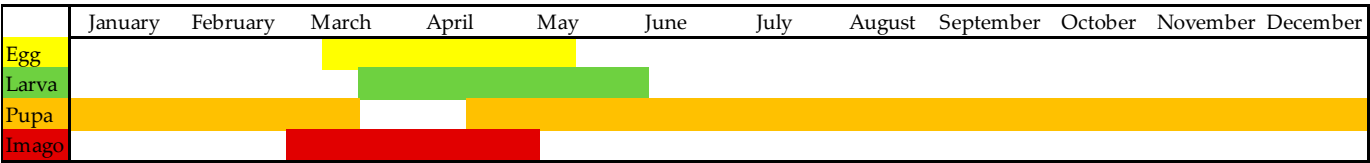


Figure 3. Phenology of *D. schmidtii* showing the timing of egg, larval, pupal, and adult (imago) stages across the year. The diagram is based on a synthesis of published collection dates, rearing observations, and life-history descriptions, summarized at a decadal (10-day) resolution.

The species overwinters in the pupal stage, with adult emergence occurring shortly after the onset of spring warming [34]. Although early-spring emergence is characteristic of many Orthosiini [35,36], the available records indicate that *D. schmidtii* appears consistently earlier than most sympatric noctuids, which may contribute to its under-representation in faunistic surveys that begin later in the season. Regional phenological variation is,

however, substantial: populations at higher elevations or latitudes emerge later than lowland populations, reflecting local temperature regimes and microclimatic conditions. Consequently, *D. schmidtii*'s timing is sensitive to interannual temperature variability. Empirical studies on other tree–moth interaction systems show that warming springs can decouple insect hatching from host budburst, producing phenological mismatches with negative fitness consequences [35,36]. Forthwith, there is no direct evidence for phenological shifts over time, and claims of climate-driven advancement should therefore be treated with caution.

4.2. Adult Behaviour and Activity

Adults are nocturnal and readily attracted to artificial light sources, including mercury vapour and mixed light traps [27]. They appear at light about half an hour after dusk, and flight activity continues late into the night. There is no evidence that *D. schmidtii* is inherently less detectable than other Orthosiini under appropriate sampling conditions. Most records derive from light trapping, while occasional individuals have been observed at sugar bait.

Flight activity appears concentrated in the early evening hours [26], although systematic behavioural studies are lacking. No evidence supports unusual thermoregulatory behaviour or habitat-dependent flight constraints. As in related species, both sexes are capable of active flight, suggesting that dispersal ability is not inherently low, although empirical data on movement or dispersal distances are unavailable.

4.3. Larval Host Plants and Feeding Ecology

The larval host plant of *D. schmidtii* has been subject to historical confusion. Early accounts mentioned *Acer* spp. or hornbeam as host plants [9,16,30–32]; however, subsequent rearing experiments and field observations have demonstrated that larvae feed on *Quercus* spp [10,33,37–39]. This correction is supported by multiple independent observations and is now widely accepted. The only confirmed host plant from field observations is *Q. cerris* and *Q. ithaburensis* subsp. *macrolepis*, while *Q. pubescens* is considered a probable secondary host, and the use of other *Quercus* species remains plausible. Records involving *A. tataricum*, *A. campestre*, or *Carpinus betulus* should therefore be considered erroneous.

Larvae hatch in early spring and feed on expanding oak buds and young leaves. Feeding initially occurs within buds, which are spun together with silk, and later shifts to external feeding as foliage develops [16,30,38]. This feeding strategy is typical of early-spring oak-feeding noctuids and does not, by itself, indicate ecological specialization beyond host association. At present, there is no reliable evidence for host specificity at the level of individual oak species, and reports of associations with particular *Quercus* taxa should be regarded as provisional unless supported by targeted rearing or oviposition data.

4.4. Larval Behaviour and Development

Larvae develop rapidly in spring and complete their growth within a relatively short period. Observations from rearing studies indicate pronounced larval activity and occasional aggressive interactions, including cannibalism under captive conditions [30]. While such behaviour has been noted, it remains unclear whether it is more pronounced than in other Orthosiini or primarily an artefact of rearing density.

Upon completion of larval development, pupation occurs in the soil, where larvae construct compact earthen cells at depths of approximately 10–15 cm [30]. The pupal stage persists throughout summer, autumn, and winter. There is no evidence for diapause at other life stages.

4.5. Habitat Associations

Available records consistently associate *D. schmidtii* with thermophilous deciduous woodland, particularly oak-dominated stands on south-facing slopes, forest edges, and

open woodland structures (Figure 4) [26,33]. Many localities are situated in ecotonal settings between closed forest and more open habitats [38]; however, this pattern may partly reflect sampling bias, as such habitats are frequently targeted during light-trapping surveys. The use of terms such as “ecotones” and “forest edges” in the context of thermophilous oak woodlands requires clarification. While sharp boundaries between closed forest and grassland are often anthropogenic, growing paleoecological and historical evidence indicates that open or semi-open woodland structures were widespread in temperate Europe prior to modern forestry, maintained by the combined effects of large herbivores, low-intensity disturbance, and heterogeneous site conditions. Recent syntheses emphasize that such structurally open, park-like woodlands were not exceptional but rather a common component of pre-industrial landscapes, particularly in the drier regions of southeastern Europe [40]. Within this framework, the habitats occupied by *D. schmidtii* are better interpreted as persistent expressions of naturally open thermophilous oak systems rather than transient edge phenomena.



Figure 4. Thermophilous oak open woodland dominated by *Quercus cerris* and *Q. ithaburensis* subsp. *macrolepis* in Greece, typical habitat of *D. schmidtii* (photo © A. Tsikas).

There is insufficient evidence to conclude that *D. schmidtii* is an ecotone specialist. Instead, the species appears to be associated with structurally heterogeneous oak woodlands, including both interior forest and transitional habitats. Claims of strict habitat specialization should therefore be treated cautiously.

From an ecological standpoint, *D. schmidtii* should be considered an indicator species of the order *Quercetalia pubescentis* woodlands. These communities are of high conservation concern across Central and Southeastern Europe [41,42], yet are often underrepresented in protected area networks. Populations of *D. schmidtii* may serve as proxies for the integrity of such habitats, given their sensitivity to microclimatic alteration, habitat fragmentation, and forest homogenization. Consequently, conservation measures targeting *Q. cerris*-dominated forests—particularly maintaining edge zones and mixed-age structure—are essential for the

persistence of *D. schmidtii* populations. By safeguarding these structural features, it is likely that not only *D. schmidtii* but a broader suite of xerothermic oak-associated Lepidoptera can persist in managed forest landscapes [43].

4.6. Summary of Ecological Knowledge and Uncertainties

In summary, the biology and ecology of *D. schmidtii* are known primarily from scattered observations rather than systematic studies. While its early-spring phenology and oak-feeding larvae are well established, many aspects—such as dispersal capacity, population density, and habitat preferences at fine spatial scales—remain poorly documented.

5. Distribution and Biogeography

The known distribution of *D. schmidtii* is confined to Central, Eastern, and Southeastern Europe, extending marginally into Asia Minor (Figure 5). The species is consistently associated with regions characterized by thermophilous oak-dominated woodland, particularly within the Pannonian Basin, the southern Carpathians, and the Balkan Peninsula. Distributional information remains uneven in quality and resolution, reflecting differences in survey intensity, historical collecting practices, and the accessibility of the regional literature.

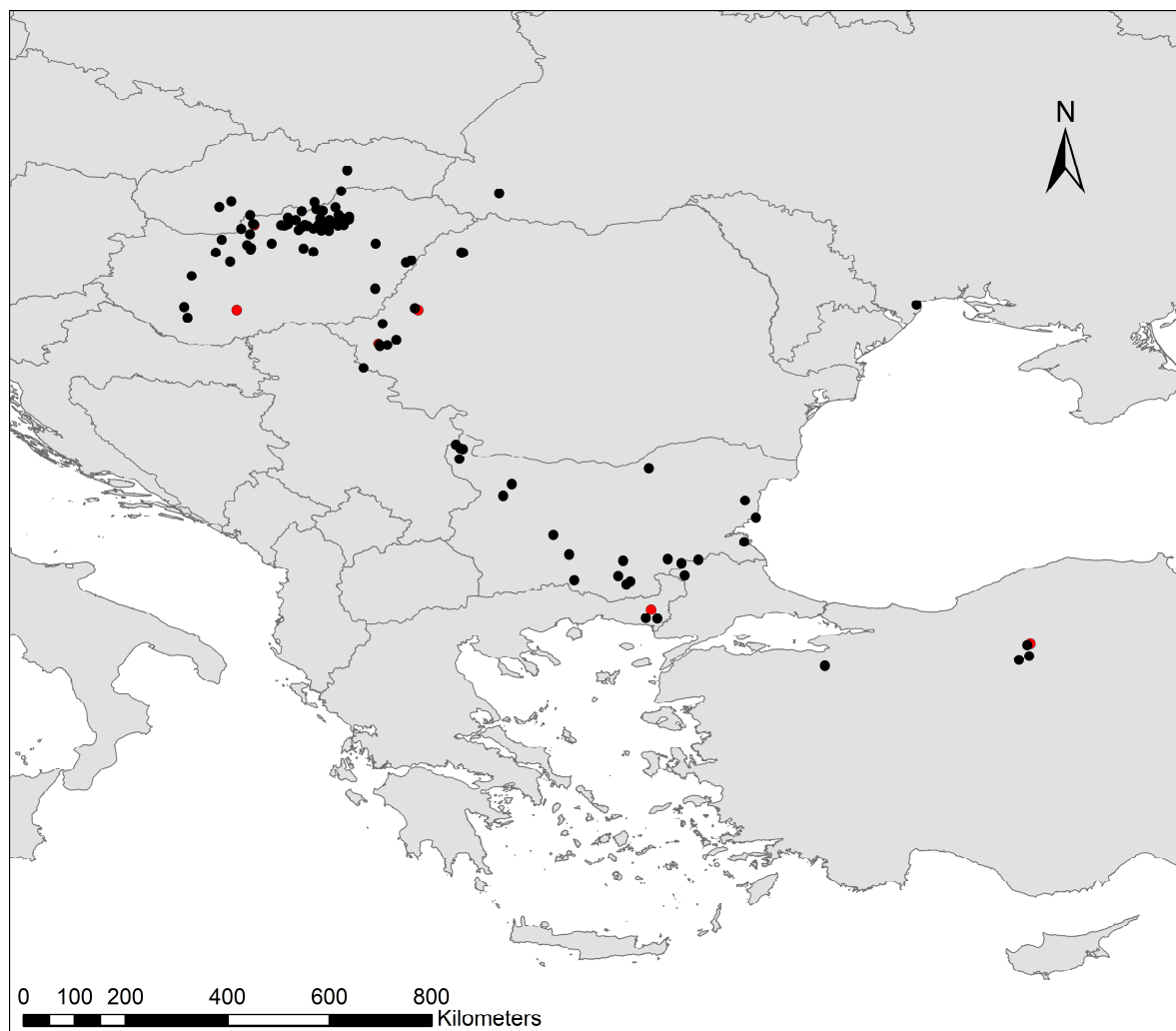


Figure 5. Confirmed distribution of *Dioszeghyana schmidtii* based on a synthesis of published literature records and vetted occurrence data obtained from GBIF. Red dots indicate GBIF records, while black dots represent records georeferenced from locality-based literature sources. Coordinates derived from the literature reflect approximate locality centroids. The map depicts confirmed regional presence rather than exhaustive fine-scale occupancy.

5.1. Central and Eastern Europe

The best-documented portion of the species' range lies within the Pannonian Basin and adjacent regions of Central and Eastern Europe [44]. Hungary represents the country with the highest number of confirmed records, reflecting both long-standing entomological activity and targeted surveys of early-spring noctuids. Records originate from multiple upland and hilly regions, including the Mátra, Bükk, Zemplén, Börzsöny, Cserhát, and Pilis Mountains, as well as from parts of the Transdanubian Central Mountains and southern Transdanubia [21–23,37,38,45–53]. Additional occurrences from lowland areas indicate that the species is not strictly confined to mountainous terrain, provided suitable oak habitats are present.

In Slovakia, *D. schmidtii* has been confirmed primarily in the southern part of the country, forming a northern extension of the Central European distribution. Records are concentrated in warm river valleys and low mountain regions, including the Ipel' and Hron basins [10,54]. Importantly, several Slovak records are based on larval collections from *Quercus cerris* and *Q. pubescens*, demonstrating local reproduction rather than sporadic adult occurrence.

Confirmed records also exist from western Ukraine, particularly in Zakarpattia near the borders with Hungary and Slovakia, and from the Odessa region [55,56]. These occurrences are geographically consistent with the species' association with warm oak-dominated landscapes along the margins of the Pannonian Basin.

Since it is known to be in south-western Slovakia close to the border with Austria and the Czech Republic, it is believed that *D. schmidtii* also occurs in the frontier zones of those two latter countries [10]. However, there is no specimen-based evidence supporting the presence of *D. schmidtii* in these countries. Its literature references from the Czech Republic may be erroneous due to the Dissolution of Czechoslovakia. Also, expansion could be plausible in southern Poland as well.

5.2. Balkan Peninsula

The Balkan Peninsula constitutes the southern and southeastern part of the European range of *D. schmidtii*, although records are more scattered and often derived from isolated faunistic studies. In Romania, the species is confirmed from the western part of the country, including areas near Ineu and Timișoara [9,30,57,58]. After the original discovery in the late 1920s, additional specimens were documented in the mid-20th century, and subsequent records have remained geographically restricted to western regions.

In Bulgaria, *D. schmidtii* has been recorded in several mountain systems, including the Eastern Rhodopes, Sakar Mountains, and parts of the Balkan Range [29,59–61], as well as from low-altitude coastal localities along the Black Sea [34]. Bulgarian populations have been attributed to the subspecies *D. schmidtii* subsp. *pinkeri* based on morphological characters [59], although the broader significance of this subdivision requires further study.

The presence of *D. schmidtii* in Serbia is less well documented. While the species is listed in national checklists and mentioned in secondary sources [59,62,63], confirmed published records are currently limited to Vojvodina [64]. Given the proximity of verified localities in neighboring Romania and Bulgaria, a wider distribution within Serbia is plausible, but remains unsubstantiated by specimen-based evidence.

In Greece, *D. schmidtii* is known to be in the northeastern regions, particularly in Eastern Macedonia and Thrace [39,65,66]. Historical museum specimens and recent confirmations indicate that Greece represents the southern limit of the species' European distribution. Greek records are associated with thermophilous oak landscapes dominated by *Quercus ithaburensis* subsp. *macrolepis* and *Q. cerris*.

5.3. Türkiye and Asia Minor

Beyond Europe, *D. schmidtii* has been reliably recorded in several regions of Türkiye, including central and southern Anatolia. Confirmed specimens originate from Ankara and Bursa provinces at moderate to high elevations [24,65,67]. A single record exists from the European part of Türkiye near Edirne, which is geographically consistent with nearby Greek populations [68].

Though its presence has been reported in Adıyaman, Antalya, and İçel, as well as the Arabian Peninsula, Iraq, Iran, Kazakhstan, Libya, Egypt, Russia, Syria, Turkmenistan, and Jordan [67,68], these records lack supporting specimen evidence and are considered doubtful. At present, there is no reliable confirmation of *D. schmidtii* from regions outside southeastern Europe and Asia Minor.

5.4. Distributional Synthesis

Overall, *D. schmidtii* exhibits a geographically restricted but environmentally coherent distribution, closely aligned with the presence of thermophilous oak woodland across Central and Southeastern Europe and adjacent parts of Asia Minor. While the species is locally documented across multiple countries, its apparent patchiness largely reflects data limitations rather than clearly demonstrated fragmentation. Improved integration of museum collections, standardized mapping, and focused surveys in suitable habitats will be crucial for clarifying the true extent of its range.

The fragmented distribution pattern of *D. schmidtii*, extending from the Pannonian Basin through Moesia and Thrace, with apparent gaps related to major geomorphological barriers such as the Carpathian Arc, closely resembles that of several other thermophilous forest-steppe specialists in southeastern Europe. Comparable range structures have been documented for taxa such as the butterfly *Colias myrmidone* [69] and the European souslik *Spermophilus citellus* [70], whose distributions reflect historical continuity of open oak woodland–grassland mosaics and their subsequent fragmentation through land-use change and forest densification. The parallel biogeographic patterns observed across phylogenetically unrelated taxa suggest shared ecological constraints linked to canopy openness, xeric conditions, and landscape connectivity, reinforcing the interpretation of *D. schmidtii* as a relict species associated with semi-open thermophilous oak systems.

6. Conservation Status, Threats, and Management Implications

6.1. Conservation Status and Legal Recognition

D. schmidtii has not been assessed at the global level under the IUCN Red List. Nevertheless, the species has been recognized as conservation-relevant in several European countries, primarily due to its restricted habitat associations and limited number of confirmed localities.

At the national level, conservation status varies. In Hungary, where the species has been recorded in multiple regions, *D. schmidtii* is legally protected and assigned a high conservation value [71,72]. In Romania, it is classified as Near Threatened in the national Red List and is included in national legislation on protected species [73,74]. In Bulgaria, the species is listed in national conservation annexes [75], although it is considered locally frequent in some regions [60]. In Serbia, *D. schmidtii* appears in the national Red List [76], but confirmed published records remain scarce.

At the European level, *D. schmidtii* is included in Annexes II and IV of the EU Habitats Directive [77] and in Resolution 6 of the Bern Convention [78], reflecting recognition of its conservation importance through habitat-based protection rather than demonstrated population decline. These listings emphasize the importance of maintaining suitable habitats rather than implementing species-specific recovery measures (Table 2).

Table 2. Habitat directive types where *D. schmidtii* occurs.

Habitat Area Code	Type of Habitat
2180	Wooded dunes of the Atlantic, Continental, and Boreal regions
91AA	Eastern white oak woods
91F0	Riparian mixed forests of <i>Quercus robur</i> , <i>Ulmus laevis</i> , and <i>Ulmus minor</i> , <i>Fraxinus excelsior</i> or <i>Fraxinus angustifolia</i> , typically found along great rivers
91G0	Pannonic woods with both <i>Quercus petraea</i> and <i>Carpinus betulus</i>
91H0	Pannonian woods with <i>Quercus pubescens</i>
91I0	Euro-Siberian steppic woods with <i>Quercus</i> spp.
91L0	Illyrian oak–hornbeam forests (<i>Erythronio</i> – <i>Carpinion</i>)
91M0	Pannonian–Balkan turkey oak—sessile oak forests

6.2. Habitat Associations and Vulnerability

Across its range, *D. schmidtii* is consistently associated with thermophilous oak-dominated woodland, particularly stands of *Quercus cerris*, *Q. pubescens*, and, in southeastern regions, *Q. ithaburensis* subsp. *macrolepis*. These habitats are typically characterized by a relatively open canopy structure, high insolation, and a heterogeneous understorey.

Such woodland types have undergone substantial transformation across Central and Southeastern Europe over the past century [79–81]. The widespread abandonment of traditional management systems—such as coppicing, wood pasture, and low-intensity grazing—has promoted succession toward denser, more homogeneous forest structures [82,83]. Numerous studies across Europe have demonstrated that canopy closure, shrub encroachment, and conversion to even-aged high forest reduce habitat suitability for thermophilous and light-demanding Lepidoptera associated with oak systems [84–86]. In this context, *D. schmidtii* should be regarded as potentially vulnerable to habitat alteration rather than intrinsically rare. Its occurrence appears to be closely tied to the persistence of structurally open oak woodland rather than to narrowly defined microhabitat features unique to the species.

From this perspective, the persistence of *D. schmidtii* in managed landscapes is not unexpected, provided that management maintains open-canopy conditions, sun-exposed oak foliage, and a heterogeneous mosaic of grassland glades and woodland patches. In contrast, the conversion of semi-open oak systems into even-aged, closed-canopy high forests leads to progressive shading, cooler microclimates, and loss of suitable larval habitat [87]. Management approaches that counteract canopy closure—such as selective thinning, restoration of coppice or wood-pasture structures, or other practices that sustain structural openness—are therefore likely to benefit this species. Similar conclusions have been reached for other thermophilous forest-steppe organisms, highlighting the broader conservation value of maintaining open oak woodland dynamics at the landscape scale.

6.3. Host Plant Phenology and Climatic Sensitivity

Available evidence indicates that larvae of *D. schmidtii* feed primarily on *Quercus cerris*, with the additional use of other xerothermic oaks in parts of its range. Like many early-spring noctuids, the species exhibits a short and temporally constrained larval period that coincides with budburst and early leaf expansion.

Phenological mismatches between Lepidoptera larvae and their host plants have been increasingly documented in oak-feeding moths, particularly under variable spring climatic conditions [35,88,89]. Earlier adult emergence, delayed budburst, frost damage, or drought stress affecting early foliage may reduce larval performance in some years. However, no species-specific data currently demonstrate that such mismatches have caused population

declines in *D. schmidtii*. These processes should therefore be considered plausible risk factors rather than confirmed threats.

6.4. Data Limitations and Monitoring Challenges

Interpretation of the conservation status of *D. schmidtii* is constrained by the limited availability of standardized monitoring data. Most records derive from faunistic surveys, museum specimens, or targeted larval collections rather than from long-term population studies. Consequently, information on population size, trends, and connectivity remains largely unavailable.

The early seasonal activity of the species may contribute to uneven documentation, as moth surveys are less frequent in late winter and early spring compared with later in the season. Nevertheless, adults are readily attracted to light, and there is no evidence that the species is inherently difficult to detect when surveys are conducted at the appropriate time. Apparent gaps in occurrence data are therefore more likely to reflect variation in survey effort than systematic under-detection.

6.5. Conservation Implications and Management Recommendations

Given the current knowledge, conservation of *D. schmidtii* should focus on the maintenance of a suitable oak woodland structure rather than on narrowly targeted species-level interventions. Management actions that promote semi-open canopy conditions, structural heterogeneity, and the persistence of thermophilous oak stands are likely to benefit the species, alongside a broader assemblage of oak-associated Lepidoptera [90,91].

Selective thinning, preservation of forest edges and glades, and avoidance of large-scale conversion of oak woodland to dense high forest or non-native plantations are consistent with conservation objectives for oak biodiversity more generally [33,38]. Where the species occurs within Natura 2000 sites, these measures can be implemented through existing habitat-based management frameworks (Table 3).

Table 3. Protected areas of the Natura 2000 network where *D. schmidtii* occurs.

Country	Protected Area	Code
Bulgaria	Bozhite mostove	BG0000487
	Derventski vazvishenia 2	BG0000219
	Emine–Irakli	BG0001004
	Kamchia	BG0000116
	Lomovete	BG0000608
	Popintsi	BG0001039
	Rabrovo	BG0000339
	Rodopi-Iztochni	BG0001032
	Rodopi-Sredni	BG0001031
	Ropotamo	BG0001001
	Sakar	BG0000212
	Tsar Petrovo	BG0000340
	Vidbol	BG0000498
	Voynitsa	BG0000500
	Vrachanski Balkan	BG0000166
	Zhdreloto na reka Tundzha	BG0000217
Greece	Vouna Evrou	GR1110005
Hungary	Aggteleki-karszt és peremterületei	HUAN20001
	Bélmegyeri Fás-pusztá	HUKM20013
	Bézma	HUBN20057
	Börzsöny	HUDI20008
	Budai-hegység	HUDI20009

Table 3. Cont.

Country	Protected Area	Code
Hungary	Budaörsi kopárok	HUDI20010
	Bujáki Csirke-hegy és Kántor-rét	HUBN20058
	Bujáki Hényeli-erdő és Alsó-rét	HUBN21094
	Domaházai Hangony-patak völgye	HUBN20021
	Egerbakta-Bátor környéki erdők	HUBN20012
	Észak-zselici erdőségek	HUDD20016
	Északi-Gerecse	HUDI20018
	Gerecse	HUDI20020
	Gödöllői-dombság	HUDI20023
	Gyepes-völgy	HUBN20014
	Gyöngyöspatai Havas	HUBN20050
	Gyöngyöstarjáni Világos-hegy és Rossz-rétek	HUBN20048
	Hencidai Csere-erdő	HUHN20011
	Hevesaranyosi-fedémesi dombvidék	HUBN20013
	Hór-völgy, Déli-Bükk	HUBN20002
	Hortobágy	HUHN20002
	Izra-völgy és az Arló-tó	HUBN20015
	Kerecsendi Berek-erdő és Lógó-part	HUBN20038
	Kisgyőri Ásottfa-tető-Csókás-völgy	HUBN20005
	Kisgyőri Halom-vár-Csincse-völgy-Cseh-völgy	HUBN20007
	Kismarja-Pocsaj-Esztári-gyepek	HUHN20008
	Körösközi erdők	HUHN20008
	Közép-Bihar	HUHN20013
	Mátrabérc-fallóskúti-rétek	HUBN20049
	Nagybarcai Liget-hegy és sajóvelezdi Égett-hegy	HUBN20025
	Nagylóci Kő-hegy	HUBN21095
	Nyugat-Cserhát és Naszály	HUDI20038
	Nyugat-Mátra	HUBN20051
	Pilis és Visegrádi-hegység	HUDI20039
	Salgó	HUBN20064
	Szarvaskő	HUBN20004
	Szentai-erdő	HUDD20063
	Szentkúti Meszes-tető	HUBN20055
	Szomolyai Kaptár-rét	HUBN20010
	Tard környéki erdőssztyepp	HUBN20009
	Tepke	HUBN20056
	Upponyi-szoros	HUBN20018
	Vár-hegy-Nagy-Eged	HUBN20008
	Velencei-hegység	HUDI20053
	Vértes	HUDI30001
Romania	Betfia	ROSAC0008
	Câmpia Nirului-Valea Ierului	ROSPA0016
	Dealul Mocreii-Rovina-Ineu	ROSAC0218
	Lunca Barcăului	ROSPA0067
	Lunca Mureșului Inferior	ROSAC0108
	Parcul Natural Cefa	ROSCI0025
Slovakia	Burdov	SKUEV0184
	Čajkovské bralie	SKUEV0262
	Cerovina	SKUEV0129
	Mochovská cerina	SKUEV0867
	Patianska cerina	SKUEV0882
	Rataj	SKUEV0865
	Starý vrch	SKUEV0157

At present, the available evidence does not allow a robust assessment of extinction risk under IUCN criteria. Until standardized population data become available, national and regional Red List assessments and habitat-focused protection remain the most appropriate conservation tools [92,93]. Future research integrating targeted surveys, standardized monitoring, and molecular data could substantially improve our understanding of the species' status and inform more precise conservation planning.

7. Conclusions

This study synthesizes current knowledge on the distribution, biology, habitat associations, and conservation context of *Dioszeghyana schmidtii*, a thermophilous oak-associated moth of Central and Southeastern Europe and parts of Asia Minor. By integrating the published literature, regional faunistic records, and curated occurrence data, I provide an updated overview of the species' known range and ecological requirements, with particular emphasis on its consistent association with open and semi-open xerothermic oak woodlands.

Available evidence indicates that the occurrence of *D. schmidtii* is closely linked to the persistence of structurally heterogeneous oak habitats dominated by *Quercus cerris* and related species. Rather than being demonstrably rare across its range, the species appears to be localized in landscapes where such habitats remain intact, while being absent from densely closed or intensively managed forest systems. This pattern highlights the importance of habitat structure and management history in shaping its distribution.

Despite its inclusion in European conservation legislation, fundamental data on population size, trends, and connectivity remain largely unavailable. As a result, assessments of conservation status rely primarily on habitat-based inference rather than on direct demographic evidence. This study therefore emphasizes the need for standardized monitoring, targeted surveys during the early spring activity period, and further research into host-plant use and phenological dynamics.

From a conservation perspective, *D. schmidtii* should be regarded as an indicator of well-preserved thermophilous oak woodland rather than as a species requiring narrowly focused management. Measures that maintain open canopy conditions, preserve forest edges and ecotones, and support the continuity of xerothermic oak stands are likely to benefit this species alongside a broader assemblage of oak-associated Lepidoptera. Future integration of ecological, molecular, and landscape-level data will be essential to refine conservation priorities and to support evidence-based assessments under national and European frameworks.

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Appendix A. Original Description and Translation of the Imago (Diószeghy, 1935)

Die kleinste Art des Genus. Spannweite 23–27, selten 30 mm. Durchschnittlich kleiner als <i>M. pulverulenta</i>, aber robuster gebaut, steht der viel größeren <i>M. stabilis</i> am nächsten. Stirnschöpfe vorspringend, die Ästchen der männlichen Fühler kürzer, Thorax und Abdomen breit, letzteres kurz. Die Vfl. breit, am Apax fein abgerundet, der Außenrand gerade. Grundfarbe und Zeichnung der glatten Vfl. äußerst beständig. Erstere graulich fahlgelb, gleichmäßig mit sehr feinen, graubraunen, nie schwarzen, Atomen bestreut, so daß der Gesamteindruck rehbraun ist. Die beiden Querlinien fehlen meist gänzlich, wo sie aber doch eben noch bemerkbar sind (nur bei den etwas lichtereren ♀♀) sind sie gleichmäßig fein verlaufend, und nirgend schärfer ausgeprägt. Die Antemediane zieht, wenn vorhanden, von der Costa gerade bis an die obere Mittelzellader, von dort gebrochen in der Richtung des Analwinkels bis zur Falte, dann gerade bis zur zweiten Radiale, von wo sie etwas auswärts laufend den Innenrand erreicht. Die Postmediane ist, wenn vorhanden, ebenfalls fein gezeichnet, sehr feinzählig, sie kommt der Nierenmakel viel näher als dies bei <i>pulverulenta</i> der Fall ist. Auch diese Linie ist nirgend kräftiger markiert.	The smallest species of the genus. Wingspan 23–27, rarely 30 mm. On average, smaller than <i>M. pulverulenta</i>, but more robustly built, and closest to the much larger <i>M. stabilis</i>. Frontal tufts projecting; branches of the male antenna shorter. Thorax and abdomen broad, the latter short. Forewings broad, apex finely rounded, outer margin straight. Ground colour and markings of the smooth forewings are extremely constant. Ground colour grayish pale yellow, evenly dusted with very fine gray-brown, never black, atoms, so that the overall impression is fawn-brown. The two transverse lines are usually completely absent; where they can still be detected (only in somewhat lighter females), they run evenly fine and are nowhere strongly expressed. The antemedian, if present, runs from the costa straight to the upper median vein, then broken toward the anal angle to the fold, then straight to the second radial, from where it runs slightly outward to the inner margin. The postmedian, if present, is likewise finely drawn, very finely toothed, and lies much closer to the reniform spot than is the case in <i>pulverulenta</i>. This line is also nowhere more strongly marked.
Die lichtgelbe Subterminale ist in der Form ähnlich der von <i>pulverulenta</i> aber ganz zusammenhängend, mit dem Saume gleichlaufend, fein, scharf, viel weniger gezähnt und im Analwinkel am kräftigsten gezeichnet. Die Ring- und Nierenmakel sind größer als bei <i>pulverulenta</i>, aber kleiner als bei <i>stabilis</i>, fein, scharf lichtgelb umrandet, voneinander ziemlich weit entfernt. Sie heben sich sehr scharf von der glatten, etwas seidenglänzenden, rehbraunen Grundfarbe ab, und sind in der Regel nicht dunkler ausgefüllt, nur bei manchen ♀♀ ist der untere Teil der Nierenmakel etwas dunkler gefärbt. Die Saumpunkte sind fein schwarz, kaum bemerkbar, die Fransenbasis scharf lichtgelb, der Raum zwischen dieser und der Subterminale etwas dunkler als die Grundfarbe.	The pale yellow subterminal line is similar in shape to that of <i>pulverulenta</i>, but entirely continuous, running parallel to the margin, fine and sharp, much less toothed, and most strongly marked at the anal angle. The orbicular and reniform spots are larger than in <i>pulverulenta</i> but smaller than in <i>stabilis</i>, finely and sharply outlined in pale yellow, set rather far apart. They stand out sharply against the smooth, slightly silky-shining fawn-brown ground colour, and are usually not darker inside, though in some females the lower part of the reniform spot is somewhat darker. Marginal dots fine, black, barely visible; basal fringe sharply pale yellow, the space between this and the subterminal line somewhat darker than the ground colour.
Die Hfl.-Grundfarbe ist fahlgelblich, leicht rosenrot angehaucht, vom Saume wurzelwärts 2 mm breit rehbraun, vom Analwinkel läuft nach oben verschwindend eine feine lichte Linie. Hinter dem sehr schwach gezeichneten Mittellmond zieht mit dem Saume parallel eine nur auf den Rippen angedeutete Linie.	Hindwing ground colour pale yellowish with a slight rosy flush; a 2 mm broad fawn-brown border runs inwards from the margin, from the anal angle a fine pale line runs upward, disappearing. Behind the very faintly marked discal spot runs a line parallel to the margin, indicated only on the veins. Fringes are light grey-brown with a faint rosy tone.

Fransen licht graubraun mit leicht rosigem Farbenton. Unterseite mit Ausnahme des Vfl.-Innenrandes—der glänzend weißlich ist—rauchgelb. Der Mittelfleck der Vfl. ein verwaschenes dunkles Fleckchen, die Postmediane eine sehr feine dunkle Linie, die auch auf den Hfl. weiterläuft. Der Raum von dieser bis zu den Fransen dunkler graubraun. Der Mittelfleck der Hfl. ein scharfer schwarzer Punkt. Das Ei ist ähnlich jenem von <i>stabilis</i>, aber kleiner, runder, grünlichweiß. Die Mycrophyle nur wenig eingedrückt, und die vielen, von hier auslaufenden Kanälchen, bestehen aus vielen kleinen Grübchen. Ein Fleck an der Mycrophyle und der Ringstreifen sind lebhaft rostbraun. Vor dem Ausschlüpfen der Raupe wird das Ei rötlichviolettgrau.	Underside smoky yellow except for the inner margin of the forewing, which is glossy whitish. Median spot of forewing is a diffuse dark speck; postmedian is a very fine dark line, which continues onto the hindwing. The space from this to the fringes darker grey-brown. Median spot of hindwing a distinct black point. The egg resembles that of <i>stabilis</i> but is smaller, rounder, greenish white. The micropyle only slightly depressed; the many radiating channels appear as small pits. A spot at the micropyle and the encircling ring band are bright rust-brown. Before larval emergence, the egg becomes reddish violet-grey.
Die Raupe ist in ihren ersten Stadien grünlichgrau, mit spärlichen schwarzen Punkten, in welchen feine Haare stehen. Halsplatte braunschwarz, Kopf glänzend schwarz. Futterpflanze <i>Acer</i>-Arten, nicht Eiche. Die weitere Entwicklung konnte nicht verfolgt werden, da die Raupen infolge mangelhafter Pflege eingingen.	The larva in its early stages is greenish-grey, with sparse black dots bearing fine hairs. Cervical plate brown-black; head glossy black. Food plants: <i>Acer</i> species, not oak. Further development could not be followed, as the larvae perished from inadequate care.
Die neue Art habe ich aus Puppen (14) gezogen, welche ich am Fuße einer Platane—<i>Platanus orientalis</i>—nahe beieinander aus der Erde gegraben.	The new species I obtained from pupae (14 in number), which I dug from the ground close together at the base of an oriental sycamore (<i>Platanus orientalis</i>).

Appendix B. Description of the Subspecies *Dioszeghyana schmidtii* Var. *pinkerii* (Hreblay, 1993)

Die beschriebene Unterart stimmt in ihrem Aufbau und den Zeichnungselementen mit <i>schmidtii schmidtii</i> überein. Die Farbe der Vorderflügel und des Körpers ist rötlich, wobei verschiedene Tönungen auftreten können. Die beschriebene Unterart unterscheidet sich von der Stammform in ihrer Farbe.	The described subspecies agrees in its structure and pattern elements with <i>schmidtii schmidtii</i>. The color of the forewings and body is reddish, with various shades possible. The described subspecies differs from the nominate form in its color.
Die Charakterisierung der Genitalien.—Beim Männchen stimmt die Struktur des Fangapparates mit jenem von <i>schmidtii schmidtii</i> überein. Das mittlere Diverticulum der Vesica ist kleiner als bei der Stammform. Der Genitalaufbau des Weibchen stimmt mit jenem der Stammform im wesentlichen überein, unterscheidet sich nur im schmalen Ductus bursae, im größeren Ausschnitt der ventralen Lamelle des Ostium und im größeren Anhang vom VIII. Sternit.	Characterization of the genitalia.—In the male, the structure of the clasping apparatus agrees with that of <i>schmidtii schmidtii</i>. The median diverticulum of the vesica is smaller than in the nominate form. The female genital structure essentially agrees with that of the nominate form, differing only in the narrower ductus bursae, the larger incision of the ventral lamella of the ostium, and the larger appendix of the VIIIth sternite.

Appendix C. Original Description and Translation of Larval Stages (König, 1971)

Da <i>schmidtii</i> eher mit <i>cruda</i> verwechselt werden kann, züchtete ich beide Arten parallel. Form und Größe der Eier von <i>schmidtii</i> und <i>cruda</i> sind zum Verwechseln ähnlich, auch die Farbe ist identisch, doch scheint der unregelmäßige Ringstreifen bei <i>schmidtii</i> etwas rötlicher zu sein. Durchmesser der Eier 0.7 mm, Eihöhe 0.4 mm, die Form weit nicht so flachgedrückt wie bei DÖRINGs Abbildung 545. Längsrippen bei <i>schmidtii</i> 40–45, bei <i>cruda</i> 45–50, Netzstruktur kaum zu unterscheiden. Die 10–15 Querrippen sind nur oben klar und werden abwärts immer undeutlicher. Eiboden glatt, etwas gerunzelt. Die Eier werden dicht nebeneinander in 2–3 Spiegelschichten abgelegt. Sie sind sehr schwach angekittet und springen beim Ablösen wie Perlen in allen Richtungen. Die Eischale ist sehr dünn und zerbrechlich. Das Verfärben beginnt nach 10–12 Tagen.	Because <i>schmidtii</i> can easily be confused with <i>cruda</i>, I reared both species in parallel. Form and size of the eggs are almost indistinguishable, also the colour identical, but the irregular encircling band in <i>schmidtii</i> seems somewhat more reddish. Diameter of eggs 0.7 mm, height 0.4 mm, not as flattened as in Döring's figure 545. Longitudinal ridges in <i>schmidtii</i> 40–45, in <i>cruda</i> 45–50, reticulation scarcely distinguishable. The 10–15 transverse ridges are only clear at the top, becoming less distinct downward. Egg base smooth, somewhat wrinkled. Eggs are deposited closely together in 2–3 overlapping layers. They are only very weakly attached and scatter in all directions when detached, like pearls. Eggshell very thin and fragile. Colour change begins after 10–12 days.
Die Räupchen schlüpfen fast gleichzeitig nach 12–16 Tagen je nach Witterungsverhältnissen. Die verlassene Eischale ist hyaline, ohne Pigmentgürtel. DIÓSZEGHY beschrieb die Eiraupe wie folgt: "... in ihren ersten Ständen grünlichgrau mit spärlichen schwarzen Punkten, in welchen feine Haare stehen. Halsplatte braunschwarz. Kopf glänzend schwarz. Futterpflanze Acer-Arten, nicht Eiche (!)". Diese Beschreibung paßt allerdings auf fast alle Noctuiden-Eiraupen. Nach dem Schlüpfen sind sie sehr flink und tasten unruhig nach Futter umher. Meine Räupchen wollten aber von Acer-Arten nichts wissen, versteckten sich dagegen rasch in halbgeöffneten Eichenknospen, die sie bald mit feinen Fäden versponnen haben. Also doch Eiche!	The young larvae hatch almost simultaneously after 12–16 days, depending on weather conditions. The empty eggshell is hyaline, without pigment belt. Diószeghy described the first instar larva as: "... in its first stages greenish-grey with sparse black dots bearing fine hairs. Cervical shield brown-black, head glossy black. Food plant <i>Acer</i> species, not oak (!)." This description, however, could apply to almost any noctuid neonate. After hatching, the larvae are very active and restlessly search for food. My larvae, however, refused <i>Acer</i> leaves, and instead quickly hid inside half-opened oak buds, which they soon spun together with silk—thus, oak after all!
Bis zur ersten Häutung—welche nach 3–4 Tagen erfolgt—werden zunächst die Herzblätter der Knospen verzehrt. Nach der ersten Häutung bekommen die Raupen ein recht buntes Aussehen und sind von <i>cruda</i>-Raupen sofort zu unterscheiden. Grundfarbe schwärzlichgrau, Rütckenlinie zitronengelb, Bauchseite grünlichgelb. Die dunkle Oberseite des Körpers ist von der helleren Unterseite auf jedem Segment einer gekrümmten Linie entlang scharf getrennt. Halsschild schwarz gerandet mit zitronengelbem Mittelfeld. Die schwarzen Haarwarzen sind ebenfalls zitronengelb umzogen. Die Kopfzeichnung der Raupen ist außerordentlich kompliziert. Sie besteht aus dunkelbraunen und schwarzen zerrissenen Flecken auf rostbrauner Grundfarbe. Augen und Haarwarzen schwarz. Die hier beschriebene Farben- und Musterzusammensetzung bleibt bis zur vollen Entwicklung unverändert.	Until the first instar (after 3–4 days), they feed initially on the inner bud leaves. After the first instar the larvae acquire a very colourful appearance and can immediately be distinguished from <i>cruda</i>. Ground colour dark greyish, dorsal line lemon-yellow, ventral side greenish-yellow. The dark dorsal surface is sharply divided from the lighter ventral side on each segment by a curved line. Prothoracic shield black-edged with a lemon-yellow centre. The black pinacula likewise ringed with lemon-yellow. The head pattern of the larvae is extremely complex, consisting of dark brown and black torn markings on a rusty-brown ground. Ocelli and pinacula are black. This colour and pattern combination remains unchanged through development.

Die Lebensweise der Raupen scheint in der Natur interessant zu sein, denn ich stieß auf manche Schwierigkeiten. Die angegriffenen Eichenknospen trockneten rasch ein. In der Natur entwickeln sich die äußeren Blätter, obwohl sie immer versponnen werden, verhältnismäßig rasch weiter und werden von den Raupen durch Fensterfraß angenagt. Die Zucht verlief bis zur dritten Häutung fast verlustlos, die Raupen wurden jedoch immer unruhiger. Sie verließen häufig die Futterpflanze, deren Blätter später nicht mehr versponnen werden, und rannten im Raupenkasten umher. Ich dachte zunächst an die Notwendigkeit eines einfachen Futterwechsels und reichte ihnen Ahorn, Linde und Ulme. Nach einigen hastigen Bissen wendeten sie sich aber ab und suchten weiter. Im Raupenkasten stand auch ein Gefäß mit Pappelzweigen, auf welchen ich junge <i>Sm. ocellata</i> Räupchen züchtete. Ich bemerkte schon früher, daß diese ohne einen sichtbaren Grund immer weniger wurden, bis ich an einem Morgen eine <i>schmidtii</i> Raupe beim Verzehren einer <i>ocellata</i> überraschte. Kannibalismus ist bei allen <i>Orthosia</i>-Arten beobachtet worden, doch konnte ich ein gegenseitiges Angreifen der <i>schmidtii</i>-Raupen nicht bemerken. Im nächsten Jahr züchtete ich wieder mehrere <i>schmidtii</i>-Raupen in einem engeren Obstglas, wo sie sich dann tatsächlich beim Begegnen gegenseitig angegriffen haben. Die Mordlust der Raupen scheint mit dem Alter anzuwachsen, denn die Unruhe ging so weit, daß viele Raupen eingingen, weil sie keine Blätter mehr annehmen wollten. Die Entdeckung kam zu spät, so erreichten, aus über 100 Jungraupen nur 7 die letzte Häutung und verpuppten sich nur zwei. Die Entwicklung der Raupen dauert 6 Wochen.	The larvae's behaviour in nature seems interesting, because I encountered difficulties. The attacked oak buds dried quickly. In nature, the outer bud leaves, although always spun together, continue to develop relatively rapidly and are window-fed by the larvae. The rearing went smoothly until the third instar, but then the larvae became increasingly restless, often leaving the food plant, later no longer spinning the leaves, and running about the breeding container. I thought at first they needed a change in food and offered maple, linden, and elm. After a few hasty bites, they turned away and searched further. In the container, there was also a vessel with poplar twigs, on which I was rearing young <i>Smerinthus ocellata</i> larvae. I had already noticed these were dwindling for no clear reason, until one morning I caught a <i>schmidtii</i> larva devouring one. Cannibalism has been observed in all <i>Orthosia</i> species, but I did not notice mutual attacks among <i>schmidtii</i> larvae at first. The next year, I reared several more <i>schmidtii</i> larvae in a smaller jar, where they indeed attacked one another upon contact. Their aggressiveness seems to increase with age, for their restlessness became so great that many perished because they would no longer accept leaves. The discovery came too late, so that of over 100 hatchlings, only 7 reached the final instar, and only 2 pupated. Larval development lasts six weeks.
Die Verpuppung erfolgt meinem Erdkokon in 10–15 cm Tiefe. Die gedrungene Puppe läßt sich von derjenigen der <i>cruda</i> kaum unterscheiden, die zwei nach unten gebogenen Kremasterdornen sind bei <i>schmidtii</i> kürzer und stumpfer. Die Puppe überwintert, die Falter schlüpfen zwischen dem 20. III. und 25. IV. Sie lassen sich von <i>cruda</i> durch ihre rehbraune Farbe, gedrungeneren Körperbau, <i>stabilis</i> ähnlichere Vorderflügel-Zeichnung und die asymmetrischen Fühlerglieder leicht unterscheiden. Letzter Körperring der <i>schmidtii</i>-Weibchen ist nicht Jegerohrartig verlängert wie bei <i>cruda</i>. Die ebenfalls von <i>cruda</i> und auch von <i>stabilis</i> wesentlich abweichenden Genitalien wurden von ISSEKUTZ (1955) und CAPUSE (1965) beschrieben und abgebildet.	Pupation takes place in a cocoon in the earth 10–15 cm deep. The compact pupa is scarcely distinguishable from that of <i>cruda</i>, but the two downward-curved cremaster spines are shorter and blunter in <i>schmidtii</i>. The pupa overwinters, and the moths emerge between 20 March and 25 April. They can be distinguished from <i>cruda</i> by their fawn-brown colour, more compact body, forewing pattern more similar to <i>stabilis</i>, and the asymmetrical antennal segments. The last abdominal segment of the <i>schmidtii</i> female is not earlike prolonged as in <i>cruda</i>. The genitalia, also differing distinctly from those of <i>cruda</i> and <i>stabilis</i>, were described and figured by Issekutz (1955) and Căpușe (1965).

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