

# The Pterophoridae fauna of Mali (Insecta: Lepidoptera)

Petr Ya. Ustjuzhanin, Vasily N. Kovtunovich, Alexey M. Prozorov,  
Mohamed M. Traore & Günter C. Müller

## Abstract

Nine species of Pterophoridae are recorded for the Republic of Mali. All species except *Exelastis pumilio* (Zeller, 1873) are recorded for the fauna of the country for the first time.

**Keywords:** Insecta, Lepidoptera, Pterophoridae, new records, Mali.

## La fauna de Pterophoridae de Malí (Insecta: Lepidoptera)

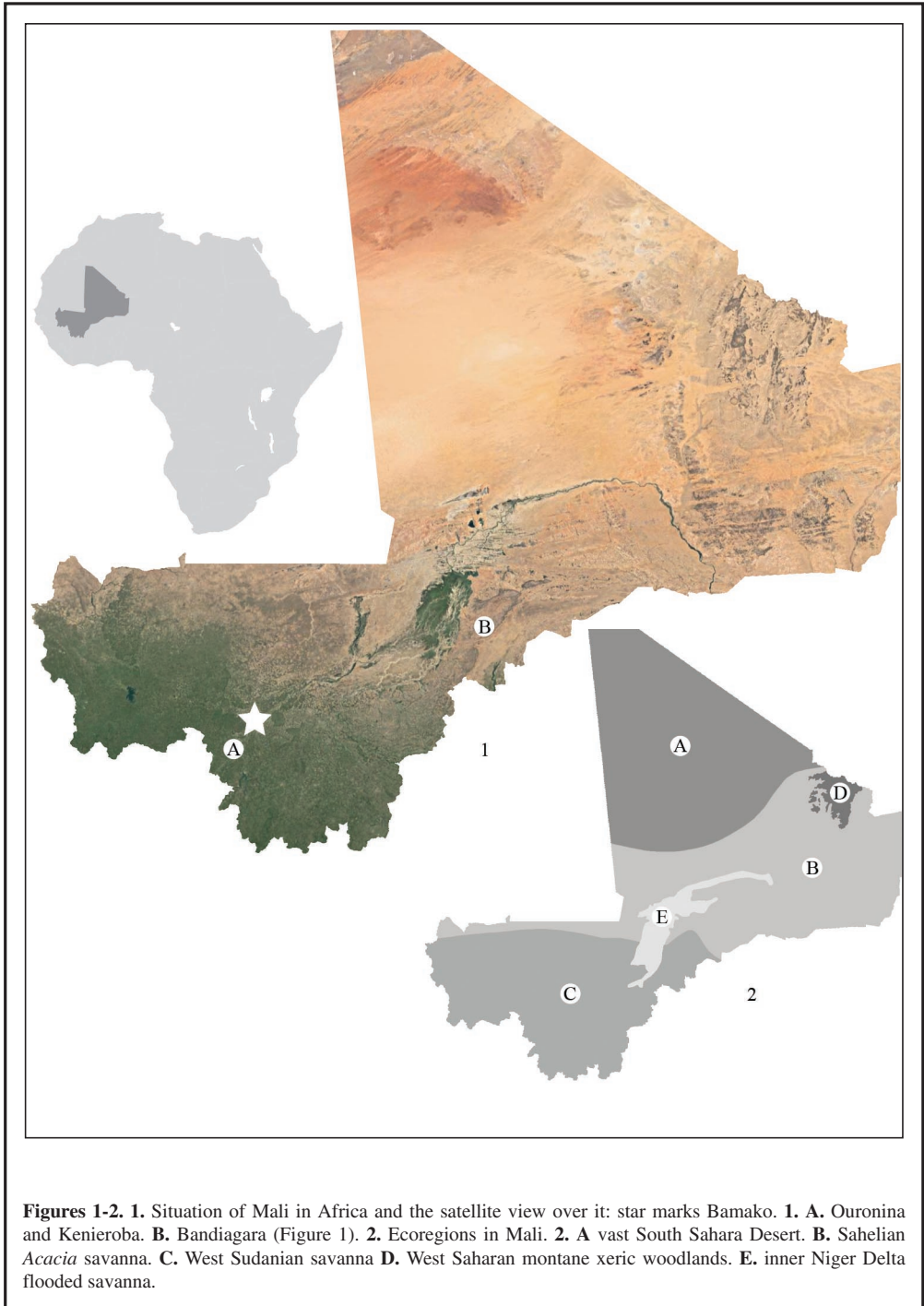
## Resumen

Se han registrado nueve especies de Pterophoridae para la República de Malí. Todas las especies, excepto *Exelastis pumilio* (Zeller, 1873), se registran por primera vez en la fauna del país.

**Palabras clave:** Insecta, Lepidoptera, Pterophoridae, nuevos registros, Malí.

## Introduction

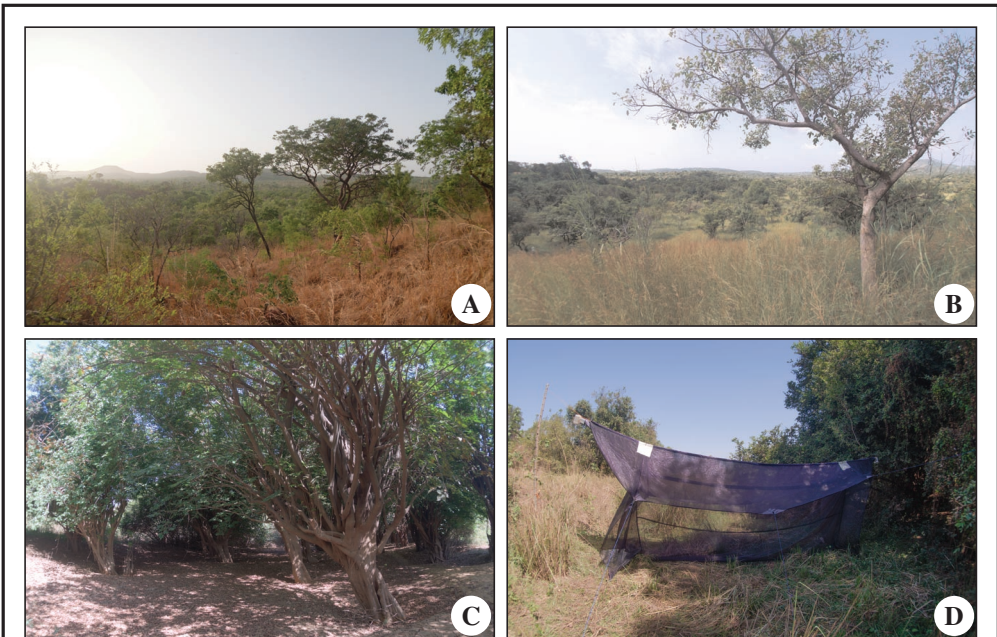
The Republic of Mali (Figure 1), with an area of 1.2 million square kilometers, is the second largest country in West Africa after Niger (UN, 2022). The territory of Mali is spread over 1600 km from north to south and includes five ecoregions (Figure 2; Dinerstein et al. 2017); the vast South Sahara Desert in the northern part of the country (Figure 2A), Sahelian *Acacia* savanna in the central part (Figure 2B), West Sudanian savanna in the southern part (Figure 2C), smaller West Saharan montane xeric woodlands in the north-eastern Kidal Region (Figure 2D), and inner Niger Delta flooded savanna in the central Mopti Region, which is along the River Niger (Figure 2E). Three seasons are distinguished: 1) a dry season from March to June with maximum day temperatures often exceeding 40° C, relative humidity slightly above 20% and almost no rainfall; 2) a rainy season from July to September with daily maximum temperatures exceeding 30° C, relative humidity above 70% and plenty of rain; and 3) an off-season from October to February with cooler nights (Nicholson, 2018). Annual precipitation varies broadly from 100 mm and less in the north to 1500 mm in the extreme south, while the overall rainfall in the whole West Africa tending to decrease (Tano et al. 2023). Annual maximum day temperatures, above 30° C, tending to grow up from decade to decade caused by climate change (Sylla et al. 2016). Reduced rainfall and growing temperatures contribute to desertification spreading southwards from the Sahara Desert resulting in the steady decrease of fertile areas (Nicholson, 2000; Nicholson, 2001; Thomas & Nigam, 2018).



Mali with a fast-growing population, above 21 million people, is the fifth most populated country in West Africa after Nigeria, Ghana, Ivory Coast, and Niger (UN, 2022). Around 65% of the population lives in the rural areas and are involved in crop and livestock production, which represents around 35% of Gross Domestic Product (Wani et al. 2018). Forests near the villages are slowly replaced with fields as the forest wood is used for charcoal production (Morton, 2007) Agriculture areas expand over time to increase the ability to produce larger amounts of crops due to worsening climate conditions (Akumaga & Tarhule, 2018; Raza et al. 2019). This leads to a decrease of natural habitats and a loss of biodiversity.

No special insect biodiversity surveys have been conducted in Mali except for those devoted to the control of human disease vectors (e.g. Goodwin, 1982). The Pan African tsetse and trypanosomiasis eradication campaign in Mali reported only an unstated number of unidentified species from three Rhopalocera genera (*Colias*, *Lycaena*, *Limnethis*) collected between 2005 and 2013 (DNEF, 2014). Larsen stated that documented data on the Rhopalocera fauna of the country “would be helpful in determining the northern and western limits of certain species” (Larsen, 2005). Altogether 197 taxa of Heterocera (De Prins & De Prins, 2011-2023) were recorded for the country.

Fauna of the family Pterophoridae of some West African countries have been published: Republic of Côte d’Ivoire (Bigot, 1962, 1970; Bigot & Boireau, 2002, 2006), Ghana (Ustjuzhanin & Kovtunovich, 2015), Liberia (Ustjuzhanin et al. 2017), Sierra Leone (Ustjuzhanin et al. 2020), and Republic of Guinea (Ustjuzhanin et al., 2022a). While no species except for *Exelastis pumilio* (Zeller, 1873) was known from Mali (Gielis, 2003). Eight out of the nine forementioned species are reported for the first time for the fauna of Mali, none of them is new to science.



**Figure 3.** Collecting sites: **A.** valley near Ouronina (June 2021). **B.** valley from uphill near Ouronina (October 2022). **C.** the Niger Riverbank near Kenieroba (January 2023). **D.** Malaise trap set on the Niger Riverbank near Kenieroba (January 2023).

## Materials and methods

The material of the present study was obtained from by-catches from long-term malaria research conducted from 2008 to 2023 by the University of Sciences, Techniques, and Technologies of Bamako, Mali (USTTB). Adults were collected with Malaise traps, UV-CDC traps, and different types of larger UV traps (Kline et al. 2011; Sheikh et al. 2016) around the following localities: Kenieroba and Ouronina in the Koulikoro Region (Figures 1A, 3A-D), and Bandiagara on the Dogon Plateau (Figure 1B). The collected material was identified and stored partially in the first author's collection and collection of the USTTB.

## List of the Pterophoridae species of the Republic of Mali

*Deuterocopus socotranus* Rebel, 1907

*Deuterocopus socotranus* Rebel, 1907. *Lep. Sokotr.*, 85, fig. 37

Type locality: W Socotra [YEMEN].

Material examined MALI, 80 km SW of Bamako, near Ouronina, N 12°6', W 8°24', 1 ♂, 1-5-IX-2021, R. and L. Yakovlev, A. Prozorov leg.

Distribution: Yemen, Rep. S. Africa, Somalia, Malawi, Zambia, Zimbabwe, Mozambique, Ivory Coast, Democratic Republic of Congo, Ghana, Kenya, Namibia, Nigeria, Tanzania, Uganda (De Prins & De Prins, 2023), Ethiopia (Ustjuzhanin et al. 2022b); Oman, Japan, India, Sri Lanka, Thailand, Taiwan, Myanmar, Indonesia, New Guinea, Australia (De Prins & De Prins, 2023), Mali. **New record for Mali.**

*Titanoptilus serrulatus* Meyrick, 1935

*Titanoptilus serrulatus* Meyrick, 1935. *Ex. Micr.*, 4, 554

Type locality: NIGERIA N, Azare.

Material examined: MALI, Ouronina Camp, N 12°6', W 8°24', 1 ♂, 10-30-IX-2015, Sáfián Sz. leg.; MALI, 80 km SW of Bamako, near Ouronina, N 12°6', W 8°24', 1 ♂, X-2022, the USTTB field team leg.

Distribution. Nigeria, Malawi (De Prins & De Prins, 2023), Mali. **New record for Mali.**

*Stenoptilodes taprobanes* (Felder & Rogenhofer, 1875)

*Amblyptilia taprobanes* Felder & Rogenhofer, 1875. *Reise Novara*, pl. 140, fig. 54

Type locality: CEYLON, [SRI LANKA].

= *Platyptilia brachymorpha* Meyrick, 1888. *Trans. ent. Soc. London*, 1888(2), 240

Type locality: Hawaii, [USA].

= *Amblyptilia seeboldi* Hofmann, 1898. *D. ent. Zeit. Iris*, 11(1), 33

Type locality: Akbès, Syria.

= *Platyptilia terlizzii* Turati, 1926. *Atti della Società Italiana di Scienze Naturali e del Museo Civico di Storia Naturale di Milano*, 65(1), 67

Type locality: Derna, Cyrenaica, [Libya].

= *Amblyptilia zavatterii* Hartig, 1953. *Bollettino della Società entomologica italiana*, 83, 67

Type locality: Zannone Island, Italy.

= *Platyptilia legrandi* Bigot, 1962. *Bull. Soc. ent. Fr.*, 67, 86

Type locality: Mahé, Beau Vallo, SEYCHELLES.

= *Stenoptilodes vittata* Service, 1966. *Proc. R. ent. Soc. Lond. (B)*, 35, 139

Type locality: Anara, ca 14 miles NNE of Kaduna, N NIGERIA.

Material examined: MALI, Dogon Plateau, at light, 9 ex. XI-2010, V. Kravchenko leg; 80 km SW of Bamako, near Ouronina, N 12°6', W 8°24', 1 ♂, 01-05-IX-2021, R. & L. Yakovlev, A. Prozorov leg.; 80 km SW of Bamako, near Ouronina, N 12°6', W 8°24', 1 ♀, 18-IX-2021, the USTTB field team leg.; 80 km SW of Bamako, near Ouronina, N 12°6', W 8°24', 4 ex, X-2022, the USTTB field team

leg.; Kangaba Distr., 25 km NW Kangaba, 100 km W Bamako, Mature deciduous Forest Savanah Mosaic, 1 ♀, IX-2012, the USTTB field team leg.

Distribution. Widespread throughout tropical and subtropical regions (Ustjuzhanin et al. 2022b).

**New species for Mali.**

*Megalorhipida leucodactylus* (Fabricius, 1794)

*Pterophorus leucodactylus* Fabricius, 1794. *Ent. syst.*, 3(2), 346

Type locality: Americae meridionalis [VIRGIN ISLANDS].

= *Pterophorus defectalis* Walker, 1864. *Cat. Lep. Het. B. M.*, 30, 943

Type locality: SIERRA LEONE.

= *Pterophorus congrualis* Walker, 1864. *Cat. Lep. Het. B. M.*, 30, 943

Type locality: South Hindostan [INDIA].

= *Pterophorus oxydactylus* Walker, 1864. *Cat. Lep. Het. B. M.*, 30, 943

Type locality: Ceylon [SRI LANKA].

= *Aciptilia hawaiiensis* Butler, 1881. *Ann. Mag. nat. Hist.*, (5)7, 408

Type locality: Uoluolu, Maui, Hawaii Islands [USA].

= *Trichoptilus ochrodactylus* Fish, 1881. *Can. Ent.*, 13, 142

Type locality: Texas, USA.

= *Trichoptilus centetes* Meyrick, 1886. *Trans. Ent. Soc. London*, 1886, 16

Type locality: Port Moresby, NEW GUINEA.

= *Trichoptilus composeshares* Meyrick, 1886. *Trans. Ent. Soc. London*, 1886, 16

Type locality: St. Vicent, CAPE VERDE ISLANDS.

= *Trichoptilus adelphodes* Meyrick, 1887. *Trans. Ent. Soc. London*, 1887(3), 266

Type locality: Carnarvon, AUSTRALIA.

= *Trichoptilus ralumensis* Pagenstecher, 1900. *Zoologica*, 29, 239

Type locality: Ralum, BISMARCK ISLANDS.

= *Trichoptilus derelictus* Meyrick, 1926. *Trans. Ent. Soc. London*, 74, 276

Type locality: Galapagos Islands ECUADOR.

= *Megalorhipida palaestinensis* Amsel, 1935. *Mitt. Zool. Mus. Berlin*, 20, 293, pl. 10, fig. 27

Type locality: Palestine, Jerusalem [ISRAEL].

Material examined: MALI, Dogon Plateau, at light, 2 ♀, XI-2010, V. Kravchenko leg; Ouronina Camp, N 12°6', W 8°24', 1 ♂, 10-30-IX-2015, Sáfíán Sz. leg.; 80 km SW of Bamako, near Ouronina, N 12°6', W 8°24', 1 ♂, 1 ♀, X-2022, the USTTB field team leg.

Distribution. Widespread throughout tropical and subtropical regions. (Ustjuzhanin et al. 2022).

**New species for Mali.**

*Prichotilus tara* Ustjuzhanin & Kovtunovich, 2011

*Prichotilus tara* Ustjuzhanin & Kovtunovich, 2011. *Amurian Zool. J.*, 3(4), 358-359, pl. 5

Type locality: Uzuzu Hill, Manizimu Forest Reserve, 25 km E of Mangochi, Mangochi District, MALAWI.

= *Prichotilus tanzanicus* Gielis, 2011. *Bol. Soc. Entom. Aragon.*, 49, 33-63, 49-50, figs 23, 40

Type locality: Kibirizi, Kigoma District, TANZANIA.

Material examined: MALI, 80 km SW of Bamako, near Ouronina, N 12°6', W 8°24', 1 ♂, 18- IX-2022, R. and L. Yakovlev, A. Prozorov leg.; Kangaba Distr., 25 km NW Kangaba, 100 km W Bamako, Mature deciduous Forest Savanah Mosaic, 1 ♂, IX-2012, the USTTB field team leg.; 80 km SW of Bamako, near Ouronina, N 12°6', W 8°24', 1 ♂, X-2022, the USTTB field team leg.

Distribution: Malawi, Tanzania (Kovtunovich et al. 2014), Mali. **New species for Mali.**

*Sphenarches anisodactylus* (Walker, 1864)

*Oxyptilus anisodactylus* Walker, 1864. *Cat. Lep. Het. B. M.*, 30, 934

Type locality: SRI LANKA.

=*Pterophorus diffusalis* Walker, 1864. *Cat. Lep. Het. B. M.*, 30, 945

Type locality: AUSTRALIA.

=*Sphenarches synophrys* Meyrick, 1886. *Trans. Ent. Soc. London*, 1886(1), 21

Type locality: NEW HEBRIDES.

=*Platyptilia pygmaeana* Strand, 1913. *Archiv für Naturgeschichte*, 78(A) (1912) (12), 30-84, pls 1-2

Type locality: Benitogebiet [EQUATORIAL GUINEA].

=*Sphenarches chroesus* Strand, 1913. *Archiv für Naturgeschichte*, 78(A) (12), 66

Type locality: Alén, Benitogebiet, [Equatorial Guinea].

=*Megalorhipida rishwani* Makhan, 1994. *SHILAP Revista de lepidopterología*, 22, 353

Type locality: SURINAME.

Material examined: MALI, 80 km SW of Bamako, near Ouronina, N 12°6', W 8°24', 1 ♂, 1 ♀, X-2022, the USTTB field team leg.

Distribution: Nepal, Japan, China, Sri Lanka, India, Taiwan, Thailand, Cambodia, Vietnam, Malaysia, Indonesia, Solomon Islands, New Guinea, Bismarck Islands, Australia, Cameroun, Seychelles, Reunion Island, Madagascar, Kenya, Tanzania, Zaire, Gambia, Guinea, Nigeria, Tchad, Malawi, Swaziland, Cote d'Ivoire, Ghana, USA, Brazil, Dominica, Grenada, Panama, Virgin Islands, Bahamas, St. Thomas, Puerto Rico, Peru, Paraguay, Fiji Islands, New Hebrides, Tonga Islands, New Caledonia, Palau, Bonin Island, Guam (De Prins & De Prins, 2023), Mali. **New record for Mali.**

*Exelastis pumilio* (Zeller, 1873)

*Mimesoptilus pumilio* Zeller, 1873. *Verh. zool.-bot. Ges. Wien*, 23, 324

Type locality: Dallas, Texas, USA.

=*Marasmarcha liophanes* Meyrick, 1886. *Trans. ent. Soc. Lond.*, 1886, 19

Type locality: Saint-Denis, RÉUNION ISLAND [FRANCE].

=*Mimaesoptilus gilvidorsis* Hedemann, 1896 nec Zeller, 1877. *Stettin. ent. Ztg.*, 57, 8

Type locality: St. Croix, VIRGIN ISLANDS [USA].

Material examined: MALI, Dogon Plateau, at light, 2 ♂, 2 ♀, XI-2010, V. Kravchenko; Ouronina Camp, N 12°6', W 8°24', 9 ex., 10-30-IX-2015, Sáfián Sz. leg.; 80 km SW of Bamako, near Ouronina, N 12°6', W 8°24', 9 ex., 18-IX-2021, R. and L. Yakovlev, A. Prozorov leg.; 80 km SW of Bamako, near Ouronina, N 12°6', W 8°24', 349 ex., IX-X-2022, the USTTB field team leg.; Kangaba Distr., 25 km NW Kangaba, 100 km W Bamako, Mature deciduous Forest Savanah Mosaic, 13 ex., IX-2012, the USTTB field team leg.

Distribution: Chad, The Gambia, Tanzania, Mali, Zimbabwe, Eswatini, Rep. S. Africa, Seychelles, Reunion Island, Madagascar, Nigeria, Kenya (DE PRINS & DE PRINS, 2020), Sierra Leone; Nepal, Cambodia, Myanmar, Philippines, New Guinea; USA, Argentina, Brazil, Ecuador, Bolivia, Colombia, Suriname, Costa Rica, Cuba, Puerto Rico, Guadeloupe, Mexico, Jamaica, Virgin Islands, Fatu-Hiva, Guam, Palau (Ustjuzhanin et al. 2019).

*Hellinsia aethiopicus* (Amsel, 1963)

*Lelioptilus aethiopicus* Amsel, 1963. *Stuttgart. Beitr. Naturk.*, 121, 6, pl. 3, fig. 4

Type locality: Gembí, ETHIOPIA.

Material examined: MALI, Dogon Plateau, at light, 1 ♂, XI-2010, V. Kravchenko.

Distribution: Democratic Republic of the Congo, Ethiopia, Ghana, Nigeria, South Africa (De Prins & De Prins, 2023), Mali. **New record for Mali.**

*Hellinsia namizimu* Kovtunovich & Ustjuzhanin, 2014

*Hellinsia namizimu* Kovtunovich & Ustjuzhanin, 2014. *Zootaxa*, 3847(4), 451-494, figs 45-48

Type locality: Mutinondo, ZAMBIA.

Material examined: MALI, 80 km SW of Bamako, near Ouronina, N 12°6', W 8°24', 2 ♂, 1 ♀, X-2022, the USTTB field team leg.

Distribution: Zambia, Malawi (De Prins & De Prins, 2023), Mali. **New species for Mali.**

## Acknowledgements

We are grateful to the late Prof. Dr. Vasilij D. Kravchenko (Tel Aviv University, Israel / USTTB, Bamako, Mali) for his dedicated entomological work in Mali: operating trapping systems, training local entomologists, and taking care of the collected material in harsh conditions. We are thankful to the USTTB which allowed us to use their field station near Ouronina, numerous village councils that approved our activities, and citizens of the surrounding villages that kindly tolerated our activities in their land.

## References

- Akumaga, U., & Tarhule, A. (2018). Projected changes in intra-season rainfall characteristics in the Niger River Basin, West Africa. *Atmosphere*, 9, 497. <https://doi.org/10.3390/atmos9120497>
- Bigot, L. (1964). Les Pterophoridae de Côte d'Ivoire. *Bulletin de la Société des Sciences Naturelles de Nîmes*, 50, 112-115.
- Bigot, L. (1970). Deuxième note sur les lépidoptères Pterophoridae de la Côte d'Ivoire. *Bulletin de l'Institut fondamental d'Afrique noire*, 32(A), 760-763.
- Bigot, L., & Boireau, P. (2002). Nouvelles données sur le peuplement des lépidoptères Pterophoridae de la Côte d'Ivoire. *Bulletin de la Société Linnéenne de Provence*, 53, 33-37.
- Bigot, L., & Boireau, P. (2006). Compléments à l'inventaire raisonne des Pterophoridae (Lepidoptera) de la Côte d'Ivoire. *Bulletin de la Société Linnéenne de Provence*, 57, 15-17.
- De Prins, J., & De Prins, W. (2011-2023). *AfroMoths*. <http://www.afromoths.net>
- Dinerstein, E., Olson, D., Joshi, A., Vynne, C., Burgess, N. D., Wikramanayake, E., Hahn, N., Palminteri, S., Hedao, P., Noss, R., Hansen, M., Locke, H., Ellis, E. C., Jones, B., Barber, C. V., Hayes, R., Kormos, C., Martin, V., Crist, E., Sechrest, W., Price, L., Baillie, J. E. M., Weeden, D., Suckling, K., Davis, C., Sizer, N., Moore, R., Thau, D., Birch, T., Potapov, P., Turubanova, S., Tyukavina, A., De Souza, N., Pintea, L., Brito, J. C., Llewellyn, O. A., Miller, A. G., Patzelt, A., Ghazanfar, S. A., Timberlake, J., Klöser, H., Shennan-Farpon, Y., Kindt, R., Barnekow Lillesø, J.-P., Van Breugel, P., Graudal, L., Voge, M., Al-Shammari, K. F., & Saleem, M. (2017). An Ecoregion-Based Approach to Protecting Half the Terrestrial Realm. *BioScience*, 1(6), 1-12. <https://doi.org/10.1093/biosci/bix014> PMID:28608869 PMCid:PMC5451287
- DNEF (Direction nationale des eaux et forêts) (2014). *Stratégie Nationale et Plan d'Actions pour la diversité biologique, Mali*. Ministère de l'Environnement de l'Eau et de l'Assainissement
- Gielis, C. (2003). Pterophoroidea and Alucitoidea (Lepidoptera). In *World Catalogue of Insects*, (Vol. 4). Apollo Books.
- Goodwin, J. T. (1982). *The Tabanidae (Diptera) of Mali*. Entomological Society of America. <https://doi.org/10.4182/FOXB7313.13-1.1>
- FAO (Food and agriculture organization) of the UN / UN environment programme (2020). *The State of the World's Forests 2020. Forests, biodiversity, and people*. Rome. <https://doi.org/10.4060/ca8642en>
- Kline, D. L., Hogsette, J. A., & Müller, G. C. (2011). Comparison of various configurations of CDC-type traps for the collection of *Phlebotomus papatasi* Scopoli in southern Israel. *Journal of Vector Ecology*, 36(1), 212-218. <https://doi.org/10.1111/j.1948-7134.2011.00133.x> PMID:21366777
- Kovtunovich, V., Ustjuzhanin, P., & Murphy, R. (2014). Plume moths of Malawi (Lepidoptera: Pterophoridae). *Zootaxa*, 3847(4), 451-494. <https://doi.org/10.11646/zootaxa.3847.4.1> PMID:25112354
- Larsen, T. B. (2005). *Butterflies of West Africa*. Apollo Books. <https://doi.org/10.1163/9789004531093>
- Morton, J. (2007) Fuelwood Consumption and Woody Biomass accumulation in Mali, West Africa. *Ethnobotany Research and Applications*, 5, 37-44. <https://doi.org/10.17348/era.5.0.37-44>
- MEEA (ministère de l'Environnement, de l'Eau et de l'Assainissement) (2014). *Cinquième Rapport du Mali sur la mise en œuvre de la Convention sur la Diversité Biologique*. Bamako.
- Nicholson, S. E. (2000). Land surface processes and Sahel climate. *Reviews of Geophysics*, 38, 117-139. <https://doi.org/10.1029/1999RG900014>
- Nicholson, S. E. (2001). Climatic and environmental change in Africa during the last two centuries. *Climate Research*, 17, 123-144. <https://doi.org/10.3354/cr017123>
- Nicholson, S. E. (2018). *Climate of the Sahel and West Africa*. Available from: <https://oxfordre.com/climatescience/display/10.1093/acrefore/9780190228620.001.0001/acrefore-9780190228620-e-510> <https://doi.org/10.1093/acrefore/9780190228620.013.510>
- Raza, A., Razzaq, A., Mehmood, S., Zou, X., Zhang, X., Lv, Y., & Xu, J. (2019). Impact of Climate Change on

- Crops Adaptation and Strategies to Tackle Its Outcome: A Review. *Plants*, 8(2), 34. <https://doi.org/10.3390/plants8020034> PMID:30704089 PMCID:PMC6409995
- Sissoko, K., van Keulen, H., Verhagen, J., Tekken, V., & Battaglini, A. (2023). Agriculture, livelihoods, and climate change in the West African Sahel. *Regional Environmental Change*, 11, 119-125. <https://doi.org/10.1007/s10113-010-0164-y>
- Schewe, J., & Levermann, A. (2017). Non-linear intensification of Sahel rainfall as a possible dynamic response to future warming. *Earth System Dynamics*, 8, 495-505. <https://doi.org/10.5194/esd-8-495-2017>
- Sheikh, A. H., Thomas, M., Bhandari, R., & Bunkar, K. (2016). Light trap and insect sampling: an overview. *International Journal of Current Research*, 8 (11), 40868-40873.
- Sylla, M. B., Annor, F., Kasei, R., & Mbaye, M. L. (2016). Chapter 5: Climate Variability and Climate Change over the Volta River Basin. In T. O. Williams, M. Mul, Ch. A. Biney & V. Smarkhtin. *The Volta River Basin. Water for food, economic growth, and environment*. Rotledge.
- Tano, A., Bouo, F., Kouamé, J., Tchétché, Y., Zézé, S., & Ouattara, B. (2023). Rainfall Variability and Trends in West Africa. *Atmospheric and Climate Sciences*, 13, 72-83. <https://doi.org/10.4236/acs.2023.131006>
- Thomas, N., & Nigam, S. (2018). Twentieth-Century Climate Change over Africa: Seasonal Hydroclimate Trends and Sahara Desert Expansion. *Journal of Climate*, 31(9), 3349-3370. <https://doi.org/10.1175/JCLI-D-17-0187.1>
- UN, United Nations Department of Economic and Social Affairs, Population Division (2022). *World Population Prospects 2022: Summary of Results*. UN DESA/POP/2022/TR/NO. 3.
- Ustjuzhanin, P., & Kovtunovich, V. (2015). On the fauna of the plume moths of Ghana (Lepidoptera: Pterophoridae). *SHILAP Revista de lepidopterología*, 43(170), 309-313.
- Ustjuzhanin, P., Kovtunovich, V., & Szabolcs, S. (2017). New data on the Pterophoridae fauna of Liberia (Lepidoptera: Pterophoridae). *Zootaxa*, 4247(2), 194-200. <https://doi.org/10.11646/zootaxa.4247.2.13> PMID:28610068
- Ustjuzhanin, P., Kovtunovich, V., Saldaitis, A., & Ustjuzhanina, A. (2019). New data on plume moths (Lepidoptera: Pterophoridae) of Oman. *Zoology in the Middle East*, 65, 75-78. <https://doi.org/10.1080/09397140.2018.1540159>
- Ustjuzhanin, P., Kovtunovich, V., Sinyayev, V., & Streltsov, A. (2020). Fauna of Pterophoridae (Lepidoptera) of Sierra Leone (Western Africa). *Ecologica Montenegrina*, 35, 26-30. <https://doi.org/10.37828/em.2020.35.3>
- Ustjuzhanin, P., Kovtunovich, V., & Streltsov, A. (2022a). Review on the fauna of Pterophoridae of the Republic of Guinea (Lepidoptera: Pterophoridae). *SHILAP Revista de lepidopterología*, 50(199), 435-439. <https://doi.org/10.57065/shilap.57>
- Ustjuzhanin, P., Kovtunovich, V., Müller, G., Prozorov, A., & Streltsov, A. (2022b). Plume Moths (Lepidoptera: Pterophoridae) of Ethiopia. Part 2. *Ecologica Montenegrina*, 53, 45-55. <https://doi.org/10.37828/em.2022.53.6>
- Wani, S. P., Sreedevi, T. K., Rockström, J., & Ramajrishma, Y. (2009). Rainfed Agriculture-Past trends and Future prospects. In S. P. Wani, J. Rockström & T. Oweis (Eds.). *Rainfed Agriculture: Unlocking the Potential; Comprehensive Assessment of Water Management in Agriculture Series* (Vol. 7). CABI Publishing. <https://doi.org/10.1079/9781845933890.0000>

\*Petr Ya. Ustjuzhanin  
Altai State University  
Lenina, 61  
RUS-656049 Barnaul  
RUSSIA / RUSSIA  
E-mail: petrtrust@mail.ru  
<https://orcid.org/0000-0002-5222-2241>

Vasily N. Kovtunovich  
Moscow Region  
Odintsovsky Distr.  
RUS-143039 Moscow  
RUSSIA / RUSSIA  
E-mail: vasko-69@mail.ru  
<https://orcid.org/0000-0001-5091-4263>

y / and

Biological Institute  
Tomsk State University  
Lenina Prospekt, 36  
RUS-634050 Tomsk  
RUSSIA / RUSSIA

Alexey M. Prozorov  
University of Sciences, Techniques and Technologies of Bamako  
BP 1805 Bamako  
MALI / MALI  
E-mail: alexeymprozorov@gmail.com  
<https://orcid.org/0000-0002-5668-0741>

Mohamed M. Traore  
University of Sciences, Techniques and Technologies of Bamako  
BP 1805 Bamako  
MALI / MALI  
E-mail: mohamedmoumine@gmail.com  
<https://orcid.org/0000-0002-0586-6706>

Günter C. Müller  
University of Sciences, Techniques and Technologies of Bamako  
BP 1805 Bamako  
MALI / MALI  
E-mail: guntercmuller@hotmail.com  
<https://orcid.org/0000-0002-7024-0179>

\*Autor para la correspondencia / *Corresponding author*

(Recibido para publicación / *Received for publication* 12-XI-2023)  
(Revisado y aceptado / *Revised and accepted* 25-XII-2023)  
(Publicado / *Published* 30-VI-2024)

**Derechos de autor:** El autor(es). Este es un artículo de acceso abierto distribuido bajo los términos de la Licencia de Reconocimiento 4.0 Internacional de Creative Commons (CC BY 4.0), que permite el uso, distribución y reproducción sin restricciones en cualquier medio, siempre que se cite al autor original y la fuente. / **Copyright:** *The author(s). This is an open access article distributed under the terms of the Creative Commons Attribution 4.0 International License (CC BY 4.0), which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.*



**Available in:**

<https://www.redalyc.org/articulo.oa?id=45579522030>

How to cite

Complete issue

More information about this article

Journal's webpage in redalyc.org

Scientific Information System Redalyc  
Diamond Open Access scientific journal network  
Non-commercial open infrastructure owned by academia

Petr Ya. Ustjuzhanin, Vasily N. Kovtunovich,  
Alexey M. Prozorov, Mohamed M. Traore, Günter C. Müller  
**The Pterophoridae fauna of Mali (Insecta: Lepidoptera)**  
**La fauna de Pterophoridae de Malí (Insecta: Lepidoptera)**

*Shilap Revista de Lepidopterología*  
vol. 52, no. 206, p. 395 - 403, 2024  
Sociedad Hispano-Luso-Americana de Lepidopterología,  
**ISSN:** 0300-5267  
**ISSN-E:** 2340-4078

**DOI:** <https://doi.org/10.57065/shilap.922>