

Selected problems of Lepidoptera protection in Soviet Central Asia, Armenia and the Caucasus Mountains

Jerzy S. Dabrowski

ul. Grabowskiego 8/4, 31-126 Kraków, Poland

At the present time, a considerable part of Europe may be regarded as an 'ecological desert'. Large areas of natural primeval ecosystems have been transformed, over hundreds or even thousands of years, into monocultures or have been covered with stone, concrete or asphalt. A rich autochthonic lepidopterofauna consequently perished and was replaced by a few species of particular adaptive abilities (Dabrowski, 1977). The unceasing increase in the application of new chemicals for plant protection and as fertilizers, and of industrial wastes etc. not only pollutes the environment in the neighbourhood of the source, but also contributes actively to the general degradation of the nature reserves, national parks and other unspoiled areas of Europe, which form a very poor network as it is. The explosion of mass tourism and the pressure from inhabitants of urbanised and industrialized agglomerations searching for new recreational areas do not promise well for the maintenance of these areas, especially those that are too small and have no effective protective zones (Dabrowski, 1979). In Europe, economic and consumptive interests are of an absolute priority while the protection of our natural environment, even with the support of the greatest scientific authorities, remains a losing battle. The problems of protecting small and insignificant species such as butterflies, are especially difficult. It is practically impossible to count on the understanding of private owners or institutions and to stop them going ahead with even small economic projects in favour of saving a butterfly population (Alberti, 1979).

In the West Tyán-Shan Mts. (Figs. 1 & 2), in the Tashkent region, the richness of the lepidopterofauna is striking for any tourist coming from Europe. Mass occurrences of some butterfly species of the families Pieridae, Papilionidae, Hesperidae, Lycaenidae and even Parnassiidae, and moths, Zygaenidae and Syntomidae, are very common. These fantastic numbers of butterflies and moths and the accompanying fauna of parasites (Hymenoptera and Diptera) exist in a balance which is incomparable to the conditions prevailing in Europe nowadays. In



Fig. 1. West Tyan-Shan Mts. Yangi Kurgan Valley. A biotope, rich in butterflies and moths, partly changed by anthropogenic factors. Species flying here include *Zygaena separata* Stgr., *Syntomis cocandica* Ersch., *Parnassius apollonius* Eversm., *Parnassius tianshanicus* Obthr., *Papilio alexanor* Esp. and *Papilio machaon* L.



Fig. 2. As fig. 1, higher up the Yangi Kurgan Valley.

Europe, up to the 1950's, a similar abundance of butterflies was still to be seen in some nature reserves and national parks e.g. on the western shore of the Black Sea, in Poland: the Pieniny Mts., the Bieszczady Mts., the Białowieża Forest and steppe reserves of the Jura Krakowska, in Switzerland: the Valais and in parts of the swiss Jura etc. Now, the effect of the introduction of a technical civilization becomes visible in Central Asia also, especially for an entomologist who observed the development of these processes in Europe.

Improvement schemes in some small valleys of the West Tyań-Shań, with the aim of bringing them, in part, under cultivation, contributed to marked disturbances of the local lepidopterofauna. This factor cut back or even destroyed populations of many species, mainly of the families Lycaenidae, Papilionidae, HesperIIDae or Parnassiidae. For species of some families e.g. Pieridae, Vanessidae, Syntomidae and Zygaenidae such activities of man in ecotone zones create, for a transitional period, possibilities of local explosions of their populations, mainly due to an increase in the abundance of their foodplants. However, such local explosions of small populations do not last long, as has been noted previously in many parts of Europe. After some years, a build up of parasites will again reduce the populations. An abundance of parasites lacking host specificity will limit populations of many other butterfly species. Small isolated butterfly populations disappear very quickly. These fluctuations of butterfly populations caused by basic farming practices are rapid and easily perceptible. In this respect Rhopalocera, Zygaenidae and Syntomidae represent very sensitive and useful indices of ecological changes in ecosystems deserving special protection. On the basis of many years observation in this region, Kreitsberg (1976, 1978) presented important conclusions concerning the problems of protecting *Papilio machaon* (L.), *P. alexanor* (Esp.), *Parnassius mnemosyne* (L.), *P. apollonius* (Ev.), *P. tianshanicus* (Oberth.) and *P. delphius* Ev. His proposition of transferring caterpillars of species which have died out with the aim of reconstituting populations is very interesting. It has been shown on the basis of my own experimental studies in Poland (Dabrowski, 1980) concerning the introduction of *Papilio machaon* (L.), *Minois dryas* (Scop.), and *Zygaena carniolica* (Scop.), that the best results are obtained when living females are transferred and released at the new locality. A female finds faultlessly the most suitable ecological niche for her progeny to develop. By this method, the transfer of parasites is avoided, which would otherwise not be the case when transferring wild larvae.

In the Armenian S.S.R., sheep-grazing has been a major factor in the destruction of biotopes. In the 1970's, due to the development of modern

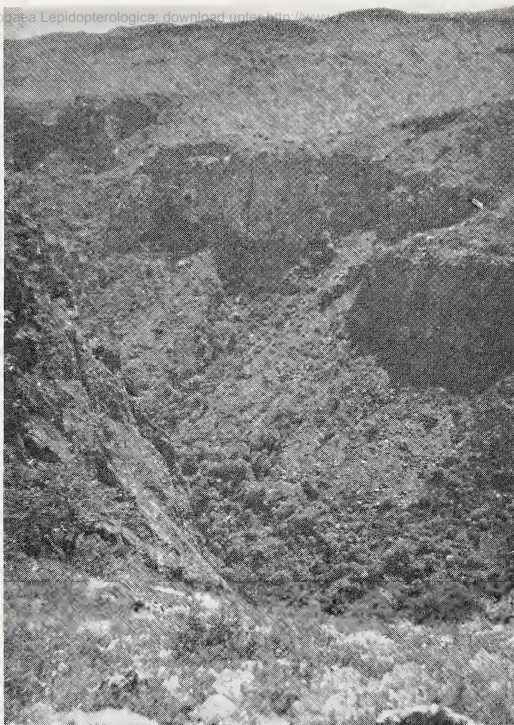


Fig. 3. Aragac Mt., Armenia. Amberd River Valley. A very rich locality for Lepidoptera not yet destroyed by civilization. Biotope of *Zygaena cuvieri* Bsd., *Zygaena cambysea* Led., *Zygaena carniolica* Scop., *Papilio machaon* L., *Papilio alexanor* Esp. and *Parnassius mnemosyne* L.



Fig. 4. The south part of Aragac Mt., above Biurakan village. Mountain steppe and boundary of *Quercus* forest. Lepidopterofauna as in fig. 3.

agriculture and mass tourism to even the most secret of localities, many highly interesting Lepidoptera refuges have rapidly deteriorated. Two, relatively small, reserves, Dylizanski zapovednik and Chosrovski zapovednik, cannot practically ensure the protection of even a representative selection of the Armenian fauna. It is indispensable to establish a network of at least a dozen or so nature reserves in the region of Aragac Mt., in the Amberd River Valley (Fig. 3), near the village of Biurakan (Fig. 4), in the Marmarik River Valley, in the region of the Gugarac Mts. and in the south near the towns Džhermuk and Kafan. The Caucasus Mts. have already a relatively well projected network of protected ecosystems, but even there an increasing pressure from man is bringing closer the situation that has existed in the Tatra Mts. and the Alps for a long time. One must analyse the possibilities of enlarging the network of greater and smaller reserves, paying special attention to providing effective protective zones around them.

The few endangered butterfly species mentioned above are given only as examples, but may be considered as key species, being very sensitive indices of instability and degradation of ecosystems that are valuable, scientifically and practically, to man.

Western civilizations are now aware that the quality of life depends on securing variety in our environment, including the rare, beautiful or even bizarre forms. If this had been realised earlier it would have been possible to avoid some ecological catastrophes and the increase in the poisoning of our environment with pesticides would not have been such a serious problem. The general purpose of nature protection is to maintain stable ecosystems in a variety of biotopes as a basic necessity for the preservation of local taxa. Without such a network of efficient reserves this is impossible to achieve.

All the areas in question, in comparison to West and Central Europe, are still in a twofold advantageous situation. They are devastated to a lesser degree by anthropogenic factors. Secondly, the legislation concerning nature protection in the Soviet Union (Reimers & Schtilmark, 1978 ; Gusiev & Pietrov, 1979) is in many respects more modern and more exigent than many western legislations. The idea is that the rules must be realized in practice and as quickly as possible, taking into account the recommendations of specialists.

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