южных ботанических провинций- низкие зимние температуры.

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BLACK FLIES (*DIPTERA, SIMULIIDAE*) OF ARMENIA

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Fauna of Armenia - black flies (Simuliidae)

Black flies are one of the most medically important groups of insects in the world. As blood-sucking organisms, these insects transmit diseases of humans and animals and cause tremendous losses to agriculture, forestry, recreation, and tourism throughout the world. The immature stages of black flies are harmless and are found in flowing waters. Because the larvae are virtually ubiquitous and have giant polytene chromosomes amenable to cytogenetic analyses, they can be used as indicators of water quality. Polluted waters often support a low number of species but enormous densities of one or a few tolerant species. Our objective was to use cytogenetics to gain insight into the biodiversity, pest status, and relation to water quality of Armenian black flies.

Materials and methods. Larvae and pupae of black flies were collected from spring to autumn of 1998 and 1999 at the following rivers of Armenia: Hrazdan, Argichi, Zhakhar, Kasakh, Azat and at the small stream in the Park Akhtanak (Yerevan).

Cytogenetic slides were prepared using the acetic-orcein and Feulgen staining methods.

Results and Discussion. Our investigation of black flies in Armenia, combined with historical records (l)*, indicates that the Armenian fauna consists of five genera and 45 species. We currently regard about eight (18%) of these species as endemic to Armenia, although some eventually might be found in surrounding countries. Nearly all flowing waters in Armenia support populations of black flies. The average number of species per stream site, at a single point in time, is approximately two, with the maximum number of species per stream site being four. Both the average and maximum values for Armenian black flies are lower than those in the Nearctic Region and the northern Palearctic Region where the average can be as high

as six and the maximum number can exceed 10. This low species richness might reflect the impact of pollution on many of the rivers and streams in the heavily developed and agricultural areas of the country.

Approximately three-quarters of the stream sites that we sampled had *Simulium caucasicum* and nearly one-third of the stream sites in our survey contained the subgenus Wilhelmia. These species were associated with streams and rivers heavily impacted by agriculture, urbanization, and industry. Their occurrence and abundance in a wide diversity of rivers and streams, from the smallest to the largest flows, suggests similarities in the quality of Armenian flowing waters, and possibly is related to a greater tolerance to pollution. We found members of the subgenus Wilhelmia to be the most significant pests of livestock, feeding in large numbers on cattle, especially in the ears.

Thus, pollution might be responsible for increased pest problems in Armenia by excluding or limiting nonpest species while providing suitable conditions for the more tolerant pest species.

Prior to our investigation, *S. caucasicum* was believed to consist of at least three to five species in Armenia. If such high diversity really does exist, it suggests healthy variability in the habitats offered by Armenian rivers and streams. We, therefore. conducted an intensive cytogenetic study of *S. caucasicum* and its presumed relatives. We found no evidence for more than a single, although highly polymorphic species, suggesting that *S. fontanum* and probably *S. kiritshenkoi* are synonyms of *S. caucasicum* and that the names sevanense and cisalpinum are also legitimate synonyms. *Simulium caucasicum* is most closely related to *S. ornatum*, which occurs throughout much of the western Palearetic Region. *Simulium caucasicum* differs from the standard banding sequence of the subgenus *Simulium* by 10 fixed inversions: three in IL, one in IIS, two in IIL, and four in IIIL. About nine autosomal polymorphisms have been found in all arms except the short arm of chromosome II. All but one of these autosomal polymorphisms is unique to *S. caucasicum*; the one that is not unique is shared with *S. ornatum*. Expression of the nucleolar organizer is also polymorphic. Sex determination is based in the IIL arm.

Our discovery of a large breeding population of *S. noelleri* in a severely polluted stream in the center of Yerevan (Ahktanak Park) represents the first Armenian record of this highly anthropogenic species. Because *S. noelleri* occurs throughout most of the Old World and the northern region of the New World, we developed a standard chromosomal map for the *S. noelleri* species group in order to compare our Armenian material with that from other populations throughout the Holarctic Region. Our standard map for the *S. noelleri* species group differs from that of the *Simulium* subgeneric standard by 11 fixed inversions: two in IS, two in IL, one in IIS, two in IIL, and four in IIIL. In the Armenian material, a subterminal inversion in IL is absolutely linked to the X chromosome, and four autosomal polymorphisms are common. We investigated the relationship of the Armenian population to that near the type locality in Germany, nearly 3000 km distant. The chromosomal similarity between the Armenian population and that near the type locality is remarkable. The banding sequence of both populations is identical in all arms, and two of the four autosomal inversions are shared. The inversion that defines the X

chromosome in the Armenian population is a common autosomal inversion in the population near the type locality. Despite a unique sex-chromosome system, we consider the Armenian material to be conspecific with true *S. noelleri*, especially given the great intervening distance between the two populations and the ecological similarities such as anthropogenic association and tendency to breed below the outlets of impoundments.

We have demonstrated, using a cytogenetic approach, that the Armenian black fly fauna has both unique elements and shared relationships with the rest of the Palearctic Region. The limited species richness on a per stream-site basis is possibly related to pollution, with the majority of Armenian streams that we sampled having been heavily impacted by agriculture, industry, and human settlement.

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О БИОЛОГИЧЕСКОЙ МОДЕЛИ ПРОГНОЗИРОВАНИЯ ПРЕДРАКОВЫХ СОСТОЯНИЙ ПРОСТАТЫ

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Диагностика рака простаты - супероксиддисмутаза - малондиальдегид

В структуре онкоурологических нозологий рак предстательной железы (РПЖ) в последние годы неизменно лидирует, а по онкологической летальности РПЖ занимает второе место после рака легкого в популяции мужчин старше 50 лет [1, 2]. Заболеваемость раком простаты прогрессирует с возрастом больше, чем при любом другом онкологическом заболевании [3]. Именно наступление мужского климакса и, как следствие, гормональный дисбаланс являются пусковым механизмом возникновения данной классической онкопатологии [4].

В связи с высокой частотой встречаемости латентного рака простаты в популяции мужчин старше 50 лет и возможностью проведения радикальной операции только при ранних, локализованных стадиях болезни клиницист