



**Fig. 7.** Localities of Permian scorpionflies mapped against the Early Permian climatic zones (localities with Kaltanidae in italic type, Lower Permian localities in bold type; localities are numbered in alphabetical order). Designations: (1) Beloshchel'e, (2) *Bortolgoy*, (3) Vorkuta, (4) *Kaltan*, (5) *Karaungir-II*, (6) Kargala, (7) Kityak, (8) Minusinsk Basin, (9) *Ngesankan*, (10) Russkii, (11) *Sarbala-II*, (12) Sokolova-II, (13) Soyana, (14) *Suriekova-I*, (15) Tikhie Gory, (16) Tyul'kino, (17) **Tshekarda**, (18) Chepanikha, (19) **Elmo**, (20) Belmont, (21) Natal, (22) Rio Grande do Sul. Climatic zones (after Chumakov and Zharkov, 2002): (NT) northern temperate; (NS) and (SS) northern and southern semiarid, respectively; (NA) and (SA) northern and southern arid, respectively; (ME) mountain equatorial; (TE) tropical equatorial; (SCT) southern cold temperate.

localities of Kaltanidae (Fig. 7) were situated at that time in places with greater humidity. Therefore, one cannot exclude that kaltanids may have merely avoided arid territories and, during the Early Permian, exclusively inhabited the Kuznetsk Basin and adjacent areas, while their descendants, Permochoristidae, at that time colonized regions that were more arid. Since the climatic conditions in the Kuznetsk Basin remained virtually unchanged during the Late Permian, kaltanids continued to live there and are abundant in fossil assemblages (Martynova, 1961; etc.).

It is worth noting that the transition from kaltanids to other Permian scorpionflies and, subsequently, to the extant taxa is rather smooth. For example, the number of the RS+MA and MP branches in the archaic Early Permian Permochoristidae Till., such as *Uraloageta* Novoksh., is no fewer (and sometimes greater!) than in the advanced Kaltanidae. The primitive permochoristids have only one or two SC branches fewer than in some kaltanids; thus, this character also shows no clear hiatus. The CuA fork is the only good diagnostic feature of kaltanids.

No scorpionfly larvae have been found in the Permian localities; however, the Tshekarda locality sometimes yields legless eruciform larvae. Of course, they could belong to any order of Permian Holometabola: however, I believe that the description of this larva may

make sense. I know of no other larvae similar to scorpionflies from the Paleozoic.

## SYSTEMATIC PALEONTOLOGY

Holometabola incertae sedis (Papilionidea?)

**Genus *Curvilarva* Novokshonov, gen. nov.**

**E t y m o l o g y.** From the Latin *curvus* (curved) and *larva* (larva).

**Type species.** *C. tshekardensis* sp. nov.

**Diagnosis.** Larva small (body length below 10 mm), markedly desimagined, eruciform; head exposed; trunk homonomously segmented; no legs revealed on thoracic or abdominal segments; body more or less slender, arched, widest about midlength.

**Composition.** Type species.

*Curvilarva tshekardensis* Novokshonov, sp. nov.

Plate 12, fig. 3

**E t y m o l o g y.** From the Tshekarda locality.

**Holotype.** PIN, no. 4987/109, moderately preserved larva (part and counterpart); Perm region, Suk-sun district, left bank of the Sylva River at the village of Tshekarda; Lower Permian, Kungurian, Koshelevka Formation.

**Description.** The body consists of 12 segments of subequal length, their dorsal parts being darker and apparently more sclerotized; each tergum bears a small tubercle near the lower margin. The head capsule is small and conspicuously sclerotized. The caudal segment is slightly elongate and tapered toward the apex, but not subacute.

**Measurements,** in mm: holotype body length in curved condition, 6; total length, about 7.5.

**Material.** In addition to the holotype, paratypes of similar size, PIN nos. 4987/110 (dorsoventral compression) and 4987/111 (compression in profile).

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