

Lycosidae (wolf spider)

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The orthognath chelicerae is considered to be the pleiomorphic condition of all spiders. Most of the currently existing spiders belong to the suborder opisthoteles, characterized by the absence of segmentation of abdomen and nervous system. It is made up of the 1) baboon spiders and its allies (Mygalomorphae) and 2) Aranaeomorphae, which is referred to as true or labidognath spiders. The apomorphic aranaemorphs have a specialized web, in which piriform silk is added to stabilize the line. In addition, these spiders have female fertilization ducts. All of these characteristics are synapomorphies, that make Aranaeomorphae monophyletic (Coddington, 2005). One of the Aranaeomorphs are the lycosoids, together with Aranaeidea and Salticidae. For wolf spiders, the synapomorph was thought to be the grate-shaped tapetum, a reflective layer within the eye that increases sensitivity (Coddington, 2005). Aside from eye arrangements, other important characteristics are 1) lack of a retrolateral tibial apophysis (RTA) on the male pedipalp, 2) egg sac carried on spinnerets of females, and 3) young carried on specialised setae on the dorsal surface of the mother's abdomen (Dondale, 1986; Griswold, 1993). Although Lycosidae and Mesothelae are considered as "big spiders" it is a polyphyletic group put together based on convergent features (Coddington, 2005). The relationships of the abovementioned groups are summarized in figure 1. The Lycosoid families are Ctenidae, Lycosidae, Miturgidae, Oxyopidae, Pisauridae, Trechaleidae, and Zoropsidae (Coddington, 2005). Lycosidae, together with Pisechridae, Pisauridae, Oxyopidae and Ctenidae, belong to the order Lycopsoidea. Based on the 12S and 16S rDNA sequences analyzed by maximum parsimony and neighbor joining analysis, Lycosidae, Psechridae,

Pisauridae and Oxyopidae are clustered together within the Lycosoidea clade (Fig. 2). Also, the Lycosidae-Pisauridae pair formed a sister group to the clade of Oxyopidae and Psechridae (Fang, et al., 2000). Currently, spiders belonging to Lycosidae are the fourth largest spider family, and these spiders are found worldwide (Platnick, 2002). They are seen worldwide, partly because they disperse as far as hundreds of kilometers from the zone site by ballooning on long buoyant silk strands. According to Wunderlich (2004), these wolf spiders have a relatively short evolutionary history, compared to other existing insects. Lycosidae are observed to be abundant in grasslands, whether tropical or temperate, and scanty in dense forests. They seem to prefer open habitats with low vegetation, since the abovementioned observation is true even in Africa, which supposedly has the highest population of wolf spiders (Jocque, Samu & Bird, 2005). They were even seen to be abundant in savannas and herb-dense vegetation such as swamp (Warui, et al., 2005). They hide in shrubby vegetation in moments of inactivity. In fact, Pisauridae are found to be rare or absent in pitfalls, and are being caught by pan traps and Malaise traps. These predators eat arthropods, usually insects (Jocque & Alderweireldt, 2005). This preference may have been a cause or a product of their evolutionary history. Since the earliest fossil record of Lycosidae was dated back to Miocene period, during which time the grassland had also been spreading, it is believed that these wolf spiders co-evolved with grasslands (Penney, 2004), and adapted to this environment by losing typical hunter adaptations, such as grip even on smooth surfaces. Since wolf spiders are hunters, they have lost the third claw, which is common among web-dwelling spiders (Jocque & Alderweireldt,

2005). They also do not have claw tufts, which should have provided perfect grip on smooth surfaces, as is what happens in Ctenidae (Kesel, Martin & Seidl, 2003). However, since grasses and herbs have rough surfaces, claw tuft is not necessary for good grip. References Dondale, C. D. (1986). The subfamilies of wolf spiders (Araneae: Lycosidae). Actas X Congreso Internacional de Aracnologia, Jaca, Espana, 1, pp. 327-332. Griswold, C. E. (1993): Investigations into the phylogeny of the lycosoid spiders and their kin (Arachnida: Araneae: Lycosoidea). Smithsonian Contributions to Zoology, 539, pp. 1-39. Jocque, R. & Alderweiltd, M. (2005). Lycosidae: the grassland spiders. Acta Zoologica Bulgarica, Suppl. 1, pp. 125-130. Jocque R., Samu, F., & Bird, T. (2005). Density of spiders (Araneae: Ctenidae) in Ivory Coast rainforests. Journal of Zoology of London, 266, pp. 105-110. Kesel A. B., Martin, A., & Seidl, T. (2003). Adhesion measurements on the attachment devices of the jumping spider *Evarcha arcuata*. The Journal of Experimental Biology, 206, pp. 2733-2738. Warui C. M., Villet, M. H., Young, T. P., & Jocque, R. (2005). Influence of grazing by large mammals on the spider community of a Kenyan Savanna. Journal of Arachnology, 22, pp. 269-279. Wunderlich, J. (2004). Fossil spiders in amber and copal. Hirschberg-Leutershausen, Joerg Wunderlich Verlag, 3A, p. 1908.