A CYTOTAXONOMICAL INVESTIGATION ON SPIDERS (ARACHNIDA: ARANEAE)

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ABSTRACT
Cytological studies on three species of spiders from Turkey (Araneae: Lycosidae, Theraphosidae) were studied. Adult and sub adult forms were used as a material. In the study, it has been determined that in Lycosidae family, diploid chromosome number is 12, in ovaries taken from sub adult female Arctosa perita (Latreille, 1799) and diploid chromosome number is 18, in testis taken from sub adult male Lycosa narborensis (Walkenaer, 1806). On the other hand; this value was determined as 2n = 16 from Theraphosidae family in sub adult female Chaetopelma anatolicum (Schmidt, Smith, 1995). But, the total length of chromosomes is less than 2 µm. So the measurements of morphometric characters were not made.

Introduction
Turkish fauna hasn’t prepared yet; and we haven’t more details about their cytogenesis features (1).

There are 38,000 species belonging to 3,000 genera and 108 families. Up to the present, about 400 out of 38,000 spider species have been studied (9, 15, 6, 8). So, only one percentage of cytological studies on spiders was reported (11, 13).

The chromosome numbers of most spiders are relatively stable in contrast to those of harvestment in arachnids (18). Although there are some exceptions, most spiders of the same genus or; even the same family that have been investigated usually certain the same number of chromosomes (9, 16). For example the chromosome numbers are 2n=28 in males and 30 in females in 7 out of 8 pisaurid spiders (Pisauridae) investigated and 2n=22 in male and 24 in female in 8 out of 20 species of theridide spiders (Theridiidae).

Exceptions provide useful information to clarify cryptic species or to test their phylogeny (3). In the present paper, 3 species of spiders of 2 families are studied cytological. Chromosome data of Arctosa perita (Latreille, 1799), Lycosa narborensis (Walkenaer, 1806) and Chaetopelma anatolicum (Schmidt, Smith, 1995) are reported for the first time.

Materials and Methods
Spiders were collected from Nizip, Burç Huzurlu pasture in Gaziantep from April to June between 2003 and 2004. All specimens were preserved in %70 ethanol and deposited in Gaziantep University, Art & Science Faculty, Biology Department, and Zoology Museum.

In this investigation A. perita, L. narborensis and C. anatolicum were studied. Collected species that alive were moved to the laboratory. The abdomen of a spider dissected out under stereomicroscope. Gonads (testis from male, ovaries from female) were removed. Tissues were transferred to the series for chromosome analysis. Chromosomal preparates were made by Throut (17) and Cokondolpler and Brown (5) methods with some changes.

Preparates were investigated under light Micros mark, MC 300A model trio ocular research microscope with 10X ocular and 40X objective. Photographs of chromoso-
me groups that studied from testis and ovaries were taken from research microscope that has digital camera system (Motic plus 2.0) mitotic chromosome groups were determined on the preparations and their films were taken on the photograph; every chromosome was droved (?) in a circle. Diploid chromosome numbers were obtained after counting circles.

Results and Discussion

*C. anatolicum* is spread out in the Mediterranean region, in Turkey. These species are found in moisture and woody areas. Males are nocturnal. Females are living in deep nests digging in the soil.

*Arctosa perita* that living under stone in arid habitats is spread out East Anatolia, Southeast Anatolia and Middle Anatolia region, in our country.

*Lycosa narbonensis* that spread out in southeast Anatolia, East Mediterranean and Middle Anatolia regions is forming galleries in soil in arid areas. During the day, the specimens aren’t going out in their nests.

In this study, mitotic metaphase chromosomes of *Lycosa narbonensis* and *Arctosa perita* belonging to Lycosidae family and *Chataepahra anatolicum* belonging to Theropsidae family were determined and
the chromosomes were counted. As a result; in *Arctosa perita* female diploid chromosome number 2n (sub adult ♀) = 12; in *Lycosa narborensis* male diploid chromosome number 2n (sub adult ♂) = 18, in *C. anatholicum* female diploid chromosome number 2n (sub adult ♀) = 16, were determined.

In the study, three methods were used. The first experiment was implicated by Budak et al. (2) with some changes. But, using some different chemicals and less or more application time; there wasn’t any result at the end of study, chromosome technique was used as second application. That study was made for grasshoppers, so they used ovaries to take tissues and choline-sodium citrate solution as a chemical material. But in our study; ovaries wasn’t a suitable material for taking chromosomes.

The last method was used by Pekar and Kral (12). As a result the length of chromosomes was measured and the value 1-2 µm was obtained. If the total length of chromosomes is less than 2 µm, the caryotype and ideograms aren’t made (10). A cytogenetically investigation on Argentina spiders, *Dysdera crocota*, (2n = 11, n = 5 + XO) belonging Dysderidae family; total chromosome length was 5-6 µm, *Ariadna boesenbergii* (2n = 9, n = 4 + XO) belonging Segestriidae family; total chromosome length was 3–4 µm; *Kukulcania hibernalis* (2n = 24, n = 11 + X1X2O) belonging Filistidae family; total chromosome length was 3 µm, *Syctodes globula* (2n = 12, n = 6 + XO) belonging Scytodidae family; total chromosome length was 2-3 µm, were obtained.

But, in that study only diploid chromosome numbers were determined and caryotype or ideograms weren’t made (7). In another cytogenetical study about *Zodarion rubidum* belonging Zodariidae family; total chromosome length was 3-4 µm but caryotype or ideograms weren’t prepared (12). In our study, for both three species; total chromosome length was 1-2 µm were measured so caryotype and ideograms weren’t made. But diploid chromosome numbers were given.

REFERENCES