



## C-heterochromatin variation in the karyotype reflects species level distinction between *Erinaceus roumanicus* and *E. concolor* (Eulipotyphla: Erinaceidae) in Turkey

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### Abstract

The distributions of C-heterochromatin blocks and nucleolar organizer regions (NORs) were studied in hedgehogs from the European (Thrace) and the Asiatic (Anatolia) parts of Turkey. Karyotypes with 48 chromosomes were found in all the specimens examined. The distribution of large heterochromatic blocks in autosomes was different between samples from Thrace and Anatolia in respect of the presence of a distal block in the autosome no. 15. These two chromosomal types correspond to the karyotypes designated as E II and E I by Mandahl (1978). The comparison with other published data shows that the karyotype E II is found within the range of *Erinaceus roumanicus*, whereas the karyotype E I occurs within the range of *E. concolor*. Both the species thus differ consistently in the distribution of C-heterochromatin blocks in their karyotypes. The NORs were found in five autosomal pairs of *E. roumanicus*, and in four autosomal pairs of *E. concolor*. The position of NORs in individual autosomal pairs may be variable, and two distinct variants were observed in the samples from northern and central/southern Anatolia, respectively. This variation may reflect the presence of two lineages within *E. concolor* that were indicated in previous phylogeographic studies.

**Key words:** chromosomes, G-banding, C-banding, NORs, distribution, systematics

### Introduction

The genus *Erinaceus* currently includes four extant species, three of them occurring in the western Palearctic region (Hutterer 2005). The West European hedgehog, *E. europaeus* Linnaeus, is distributed in Western Europe, Scandinavia, and north-western parts of European Russia (Mitchell-Jones *et al.* 1999). Its range is parapatric with other species distributed eastwards through central, eastern, and south-eastern Europe including the Balkans, to northern Caucasus and western Siberia (Hutterer 2005). The East European (or white-breasted) hedgehog (*E. concolor* Martin) has recently been subdivided into two distinct species with parapatric distributions, *E. roumanicus* Barret-Hamilton (Northern white-breasted hedgehog) and *E. concolor* (Southern white-breasted hedgehog) based on biochemical and molecular phylogenetic studies (Filippucci & Simson 1996; Santucci *et al.* 1998; Suchentrunk *et al.* 1998; Seddon *et al.* 2001, 2002; Bannikova *et al.* 2003). This species distinction is also supported by morphological data (Holz 1978; Kryštufek 2002).

Karyological investigations of hedgehogs belonging to the genus *Erinaceus* were carried in various parts of Europe (Bovey 1949; Jordan 1960; Král 1967; Geisler & Gropp 1967; Gropp *et al.* 1969; Orlov 1969; Markov & Dobrijanov 1974; Dulic & Tvrtkovic 1979; Kryštufek 1983; Giagia & Ondrias 1980; Zima & Král 1984; Searle & Erskine 1985; Sokolov *et al.* 1991; Sánchez *et al.* 1994; Gavrilă *et al.* 1998), in Siberia (Grphodatsky *et al.* 1981), Jordan (Qumsiyeh 1991), the Caucasus area (Sokolov *et al.* 1991), Turkey (Doğramacı