A NEW POPULATION OF RATTUS RATTUS WITH 38 CHROMOSOMES IN NORTH-WESTERN INDIA

Recent karyological studies on Rattus rattus in different parts of the world have created a new interest. Contrary to the earlier concepts (Yousita et al.1, Grupp et al.2, Capanna and Civitelli3), it is now known that the Indian subspecies, particularly Southern India, too has Rattus rattus subspecies with 2n = 38 (Lakhotia et al.4, Sharma and Rajiva Raman5). Recently there was another report from the same part of the country on Rattus rattus in which all individuals examined showed 2n = 38 except for one female 2n = 39 with a supernumerary B chromosome (Satyaparakash and Ananthanarayanan5). Here we report a new population of Rattus rattus from Ahmedabad (North-Western India) with 38 chromosomes.

Direct bone marrow preparations were obtained using the standard sickling technique. Animals were injected with 0·2% calcium citrate (0·3 ml/kg body weight) 2 hr prior to sacrifice and the bone marrows were treated with hypotonic 0·9% potassium chloride for 20 minutes and fixed in acid methanol (1:3). Slides were prepared by keeping a few drops of suspension in fresh fixative on a cover-glass and slides were allowed to dry at room temperature. The slides were stained with Carbol Fuchsin.

A total of 9 male and 8 female adults, collected from the highly populated areas of Ahmedabad, were used in the present study. Coat color was seen to vary in the individuals. Majority of them had a dull black dorsal skin and almost white belly, some had dull black skin but belly had some black pigmentation and in one individual both the back and belly were really dull black as in Rattus rattus反射s. The white-bellied speci-
mens were identified as Rattus rattus wrooungi Hinton and the black-bellied specimen as Rattus rattus反射s (Grey).

All the individuals uniformly have 2n = 38 chromosomes and display identical karyotypes (Fig. 1). The karyotype however differs slightly from other published karyotypes of Rattus rattus populations with 38 chromosomes. In Table I the karyotype of the present population is compared with the karyotypes of Rattus rattus wrooungi and Rattus rattus反射s from South-Western India having 2n = 42 and 2n = 38 respectively (see Lakhotia et al.4). It can be seen that the present karyotype with 38 chromosomes resembles the karyotype of Rattus rattus wrooungi which also has 38 chromosomes, except that in the former, there is only one small submetacentric while in the latter, there are two. In the present Rattus rattus the acrocentrics are 8 pairs while in Rattus rattus反射s from the South there are only 7 pairs. The condition with two subacrocentrics is observed in the published karyotypes of European population (Capanna and Civitelli3) and African population (Capanna and Civitelli3). The present karyotype with only one subacrocentric may be due to a single pericentric inversion of the medium sized acrocentric pair instead of two as in other 36 karyotypes.

![Fig. 1. Karyotype of a male Rattus rattus from North-Western India.](image)

<table>
<thead>
<tr>
<th>Chromosome type</th>
<th>R. r. wrooungi*</th>
<th>R. r. wrooungi (Negro, Mysore State)</th>
<th>R. r.反射s (Jacob, Mysore State)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2n = 42</td>
<td>13</td>
<td>13</td>
<td>13</td>
</tr>
<tr>
<td>Large subacrocentric</td>
<td>8</td>
<td>8</td>
<td>7</td>
</tr>
<tr>
<td>Small metacentric</td>
<td>7</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>Large acrocentric</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Subacrocentric</td>
<td>7</td>
<td>7</td>
<td>7</td>
</tr>
</tbody>
</table>


Earlier studies indicated that in India, Rattus rattus with 2n = 38 was probably confined to the Southern peninsular region. Thus Lakhotia et al.4 reported R. r.反射s from South-Western India to have 2n = 38. Sharma and Rajiva Raman5 have reported 2n = 38 both from R. r.反射s from Quillon and Nagpur and R. r. wrooungi

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from Quillan and Fairmamore. All these places are south of Ahmedabad from where the present R. r. urumathini (and also R. r. referens) have been collected. We do not know whether further north also Rattus norvegicus with 2n = 38 can be found. So far all the reports have shown only 2n = 42 or more for Rattus norvegicus from north India. It is significant, however, that we have not yet obtained a single Rattus rattus from Ahmedabad with more than 2n = 38 chromosomes. Obviously, much more extensive work is required to analyze the perplexing graph of karyotype variability and evolution in Rattus racemae.

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V. C. Shah, S. C. Lakhotia, K. Aravinda Bhui

7. Sharma, T. and Rajput Ramon, Proceedings of 19 Cell Biology Conference, Delhi University, p. 31 (Abstract).