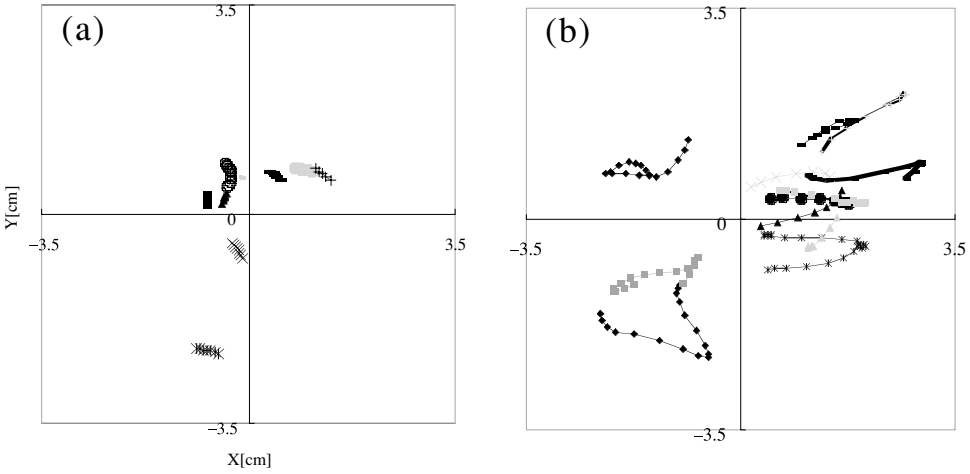

Fig. A1. Chains were extracted from an SKG. (a) Chain 1 and (b) chain 2 These figures have already shown to define the chains by TAKADA *et al.* (2003b).

Appendix

New quantification indices—'sparse density: S_2', 'sparse density: S_3', 'total locus length of chain 1', and 'total locus length of chain 2'—were proposed by TAKADA *et al.* (2003b). We herein review the definitions of the SPDs and chains.

Sparse density (SPD)

SPD was defined by a scaling average of the ratio as $G_j(l)/G_j(k)$. An SKG was divided into quadrates of which the latus is j times longer than the resolution, and $G_j(k)$ expressed the amount of divisions including more than k measured points. If the centre of gravity does not move, the SPD value becomes 1. If there are variations in the SKGs, it becomes greater than 1. In this manner, the SPD depends on the characteristic of the SKG and the motion process of the centre of gravity (TAKADA *et al.*, 2003b).

The anterior-posterior direction y was considered to be independent of the medial-lateral direction x (GOLDIE *et al.*, 1989). Stochastic differential equations (SDEs) on the Euclid space $\mathbf{E}^2 \in (x, y)$

$$\frac{dx}{dt} = -\frac{\partial}{\partial x} U_x(x) + w_x(t)$$

$$\frac{dy}{dt} = -\frac{\partial}{\partial x} U_y(x) + w_y(t)$$

have been proposed as a mathematical model that generates the SKGs (COLLINS and DE