- 3P332 触角に人工的な付属器を装着されたオカダンゴムシの探索行動 (その2)
○森山 徹¹
¹はこだて未来大・複雑系
- 3aK06 Exploratory behavior in pill bugs wearing artificial attachments on their antennae (2)
Tbhru Moriyama (Dept. Complex Syst., Future Univ. Hakodate)

The antennae of pill bugs (*Armadillidium vulgare*) were covered with Teflon tubes. They were placed respectively on a white acrylic arena, of which the edge was overhung cliff, for fifteen minutes. While normal individuals without tubes spent a lot of time hanging out of the edge, those with tubes did walking the edge. The reason why they changed the behavioral pattern drastically will be discussed with watching movies of the experiment on PC.*This study was supported in part by the Ministry of Education, Science, Sports and Culture, Grant-in-Aid, Young Scientists (B) 18700258.

- 3P333 アリのデジタル歩行とスケーリング則
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- The digital nature involved in the locomotion of ant and the scaling rule
Kazumitsu Hanai,Hiroto Shoji,Mamiko Ozaki,Daigo Yamauchi (1:Dept. Physics, Kyoto Pref. Univ. Med.;2: Dept. Biol., Fac. of Sci., Kobe Univ.;3: Dept. App. Biol., Kyoto Inst. Tech.)

The locomotor activity of ant was examined after recording into digital video tapes for longer than 1 hr. The digital video was taken into a personal computer as a movie file. After converting the movie file into sequential image files at 30 frames/sec, the ordinates of the center of gravity was calculated. The variance of the velocity was very large, and the velocity histogram was not that of the Gaussian which would be expected if the animal smoothly moved at a mean velocity.The occurrences of both move and rest events at specified duration were expressed approximately as the sum of several exponential functions of the duration time. In general, the number of exponential terms for the move events were less than those of the rest duration. The more the number of exponential terms, the distribution is more similar to that of the power law. When all the moving velocities of the similar duration were averaged, the longest one showed clear on and off of moving drive force, which suggest that there are several the moving events of the discrete duration in the ant, each of which is digital irrespective of the surrounding environment of nestmates or non-nestmates.

- 3P334 コカイン投与マウスのロコモータ活性の解析
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ジング
- The Characteristics of the locomotor activity in cocaine-applied mice
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Cocaine is a famous psychomotor stimulant that increases locomotor activity, elevates mood with rewarding euphoria and produces fearful and jittery aversive. However, the behavioral effects in the psychomotor activity are still remained unclear.

We have investigated the effect of cocaine on the mouse locomotor activity. A mouse freely walked around in the circular field 60cm in diameter, with the wall 40cm high. The mouse walk was recorded in the digital video camera, and it was taken into a personal computer as a movie file. After converting the movie file into sequential image file at 30 frames/sec, the centroid and n-th image moments were calculated. The body axis was determined from the image moments.

The cocaine-applied mice showed higher activity during walking movement and larger variance of the body axis accompanying with the walk in the central area of the field than the saline-applied control mice.

We will also discuss the Behavioral characters of cocaine-applied mice by using mathematical model.

- 3P335 モルヒネ報酬効果および探索行動の発現におけるアラキドン酸カスケードの関与
○窪田 剛志¹、梶野 豊¹
¹徳島文理大・香川薬・生物物理
- Involvement of arachidonic acid cascade in morphine dependence
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Recent report has revealed that morphine activates arachidonic acid cascade via μ opioid receptor. In this study, we investigated the role of arachidonic acid cascade in the expression of morphine rewarding effect and morphine seeking behavior using lever-pressing associated drug self-administration (SA) paradigm in rats. Rats acquired morphine taking behavior by 10 days of training sessions under the fixed ratio 1 schedule and this behavior was extinguished when saline was substituted for morphine. A morphine-priming injection (1.0 mg/kg, i.p.) elicited furious reinstatement of lever-pressing in morphine-experienced rats although only saline was available for infusion. This reinstatement of lever-pressing may reflect morphine seeking behavior based on craving for morphine taking. Pre-treatment of cyclooxygenase inhibitor, diclofenac (32 mg/kg, i.p.), attenuated morphine seeking behavior induced by morphine-priming injection. Under the progressive ratio schedule of SA, that is useful to measure drug rewarding efficacy, administration of diclofenac (32 mg/kg, i.p.) downregulated braking point for morphine infusion. It suggested that diclofenac reduced morphine rewarding efficacy. Amount of prostaglandin E2 (PGE2) was augmented in the nucleus accumbens and the ventral tegmental area during morphine reward might be expressed. These results suggest that activation of arachidonic acid cascade, especially elevation of PGE2 synthesis, plays an important role in the expression of morphine reinforcement and craving.