

# Studies on Marble-Burying Behavior in Marble-Burying Behavior as an Animal Model of Obsessive-Compulsive Disorder

Michihiko MATSUSHITA<sup>1</sup>, Nobuaki EGASHIRA<sup>2</sup>, Ryoko OKUNO<sup>2</sup>,  
Satoko HARADA<sup>2</sup>, Junya TSUKADA<sup>1</sup>, Yoshiaki KIYOHARA<sup>1</sup>,  
Shozo CHIDORI<sup>1</sup>, Naoki UCHIDA<sup>1</sup>, Kenichi MISHIMA<sup>2</sup>,  
Katsunori IWASAKI<sup>2</sup>, Michihiro FUJIWARA<sup>2</sup>, Ryoji NISHIMURA<sup>1</sup>

<sup>1</sup> *Department of Psychiatry, Faculty of Medicine, Fukuoka University*

<sup>2</sup> *Department of Neuropharmacology, Faculty of Pharmaceutical Sciences, Fukuoka University*

**Abstract**: In the present study, we examined the involvement of serotonin (5-hydroxytryptamine, 5-HT)<sub>1A</sub> receptor in marble-burying behavior, which has been considered to be an animal model of obsessive-compulsive disorder (OCD). 8-OH-DPAT, a full 5-HT<sub>1A</sub> receptor agonist, inhibited marble-burying behavior without affecting the locomotor activity at a dose of 3 mg/kg (i.p.). Similarly, fluvoxamine (30, 60 mg/kg, p.o.), paroxetine (1, 3 mg/kg, p.o.) and milnacipran (60 mg/kg, p.o.) inhibited marble-burying behavior. The inhibitory effect of 8-OH-DPAT or paroxetine was antagonized by WAY-100635 (3 mg/kg, i.p.), a 5-HT<sub>1A</sub> receptor antagonist, whereas those effects of fluvoxamine or milnacipran was not antagonized by WAY-100635. On the other hand, haloperidol (0.1 mg/kg, i.p.) significantly reduced the number of buried marbles. However, these drugs at the same dose significantly reduced locomotor activity and impaired motor coordination in the rota-rod test. The low-dose haloperidol (0.01 mg/kg, i.p.) or fluvoxamine (10 mg/kg, p.o.) did not significantly reduce the number of buried marbles, but the low-dose combination of fluvoxamine and haloperidol inhibited the marble-burying behavior without affecting the locomotor activity. These findings suggest that combining antipsychotic with selective serotonin reuptake inhibitor (SSRI) may be a clinically useful drug in the treatment of intractable obsessive compulsive disorder.

**Key words**: **Marble-burying behavior, Obsessive-compulsive disorder, selective serotonin reuptake inhibitor (SSRI), antipsychotic drug, 5-HT<sub>1A</sub> receptor**