

SUPPLEMENTARY MATERIAL

Paeoniflorin benzoates: synthesis and influence on learning and memory of aged rats in the passive avoidance task

Lidia Baltina^{a*}, Tatyana Sapozhnikova^a, Nina Makara^a, Svetlana Gabdrakhmanova^a, Lia Baltina^a, Rimma Kondratenko^b

^a*Ufa Institute of Chemistry, Ufa Federal Research Centre of the Russian Academy of Sciences, 71, prospect Oktyabrya, Ufa, 450054, Russian Federation*

^b*Bashkir State Medicinal University, Ministry of Health, Ufa, Russian Federation*

E-mail: baltina@anrb.ru

Paeoniflorin per-O-benzoates with the preserved pinane structure **2** and rearranged aglycone **3**, containing C4=O function, were obtained and their influence on learning and memory of aged rats was studied in the passive avoidance task. It was found that the chemical modification of paeoniflorin affected the cognitive functions of aged rats. The introduction of C4 = O function into the pinane part of benzoate **3** led to the improvement in learning process and preservation of the memory trace in aged rats as compared to the natural glycoside. This compound can be considered as the promising for further studies on *in vivo* models of disorders characteristic for Alzheimer disease.

Keywords: paeoniflorin, benzoates, passive avoidance task, rats

NMR data

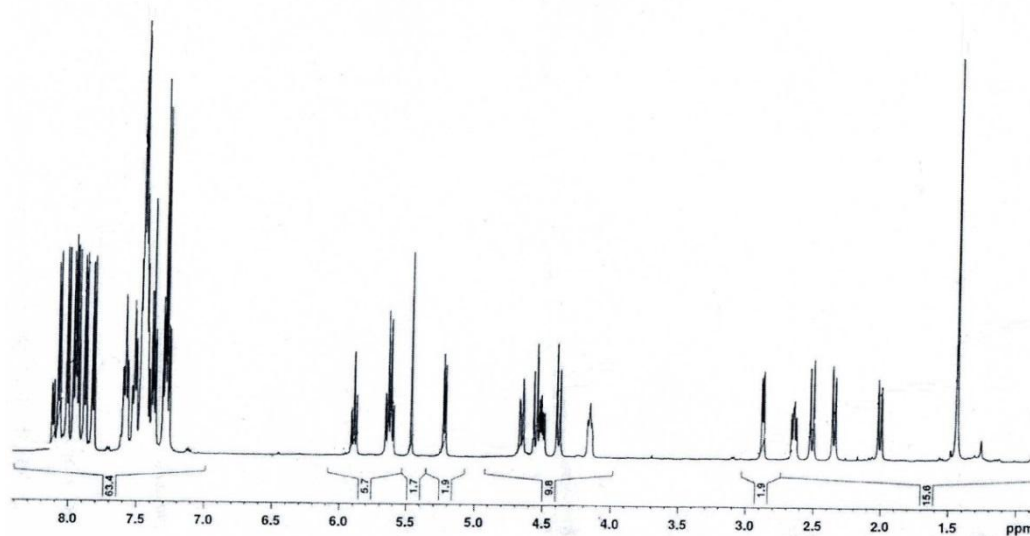
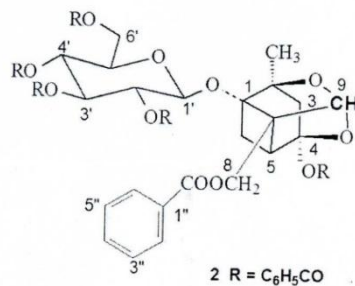


Figure S1. ¹H NMR (CDCl₃) for compound **2**.

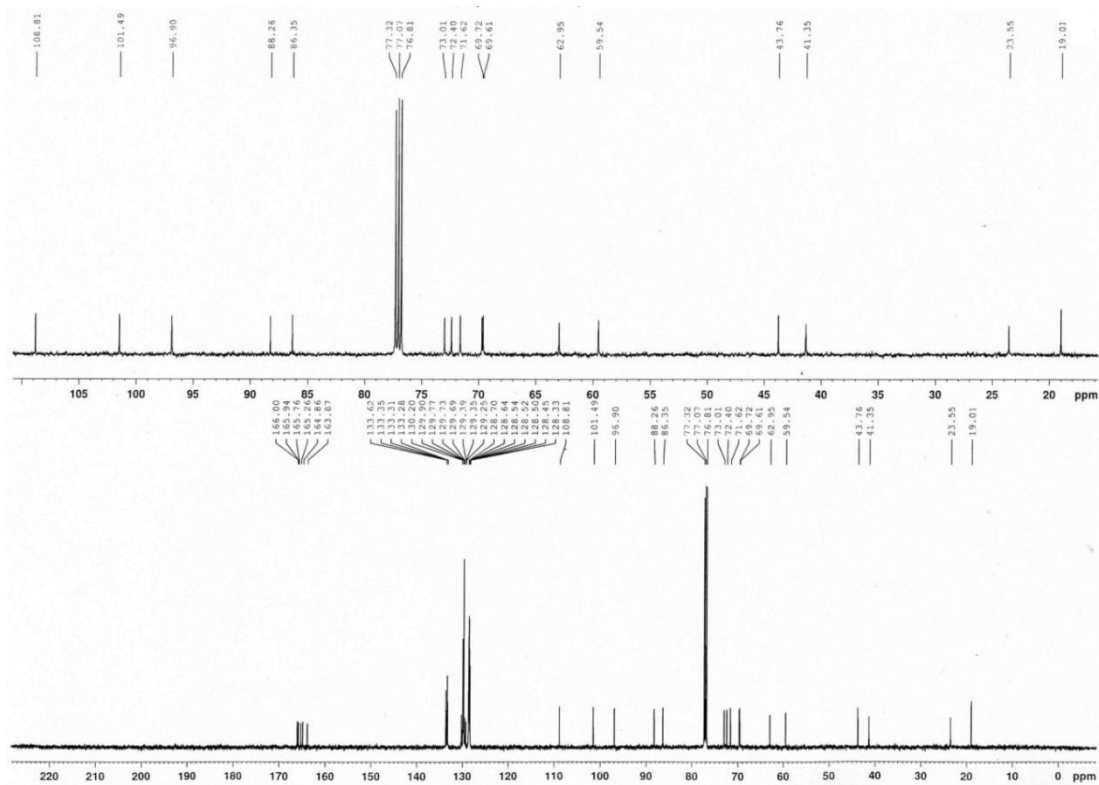


Figure S2. ¹³C NMR (CDCl₃) for compound **2**

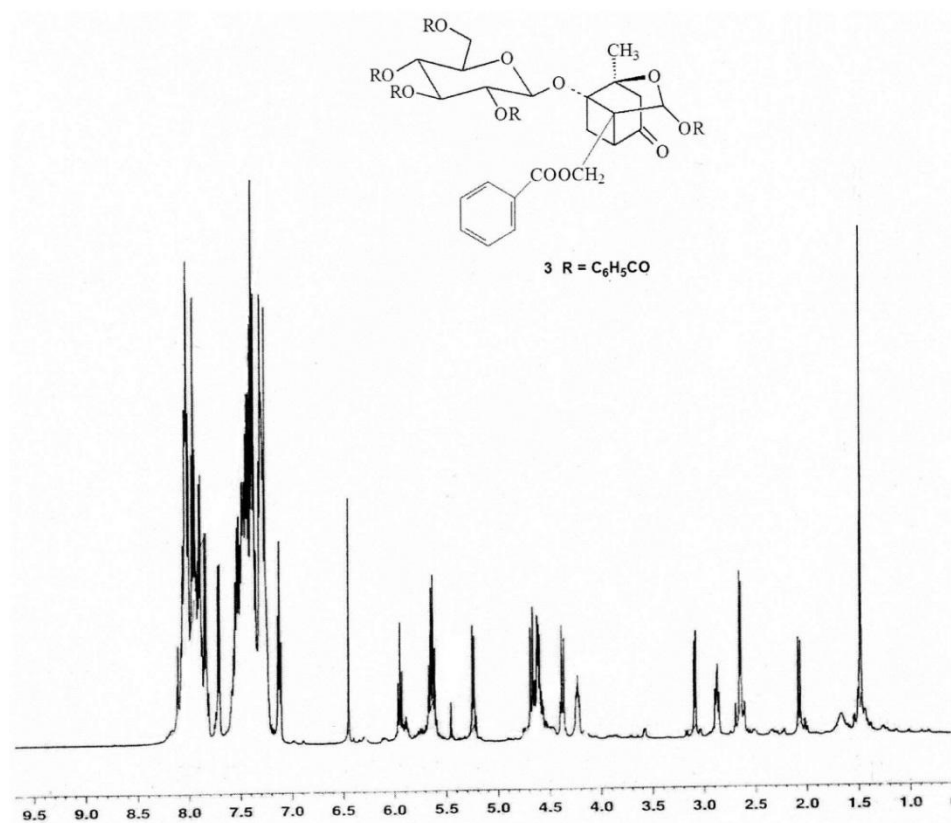


Figure S3. ^1H NMR (CDCl_3) for compound **3**

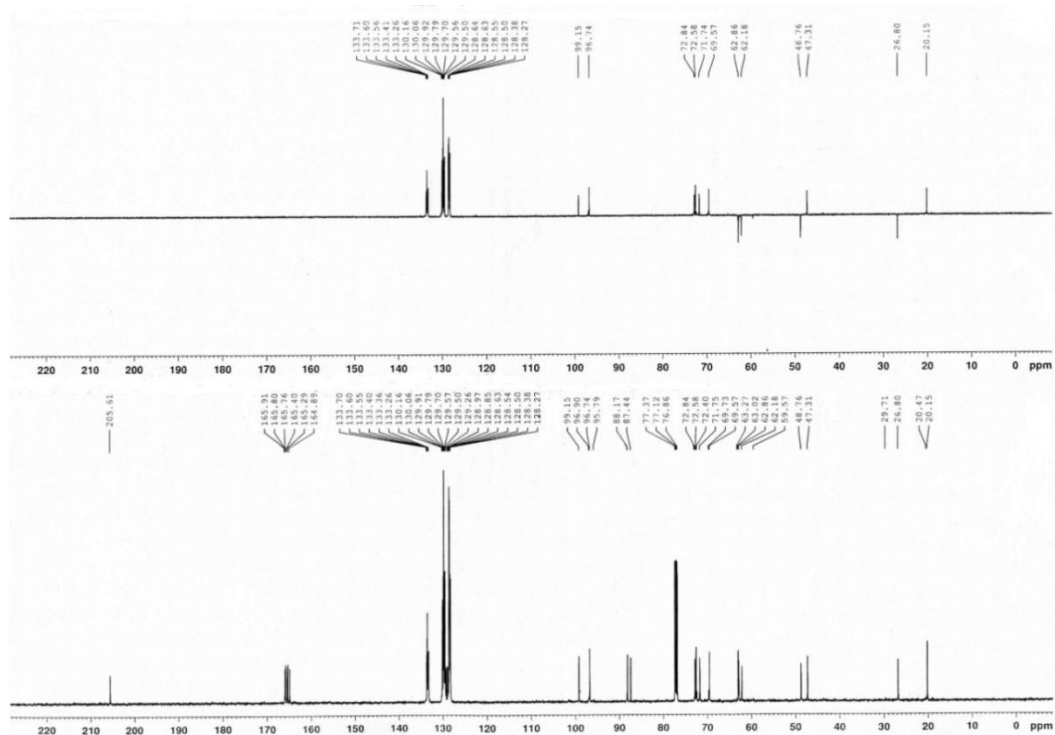


Figure S4. ^{13}C NMR (125 MHz, CDCl_3) for compound **3**

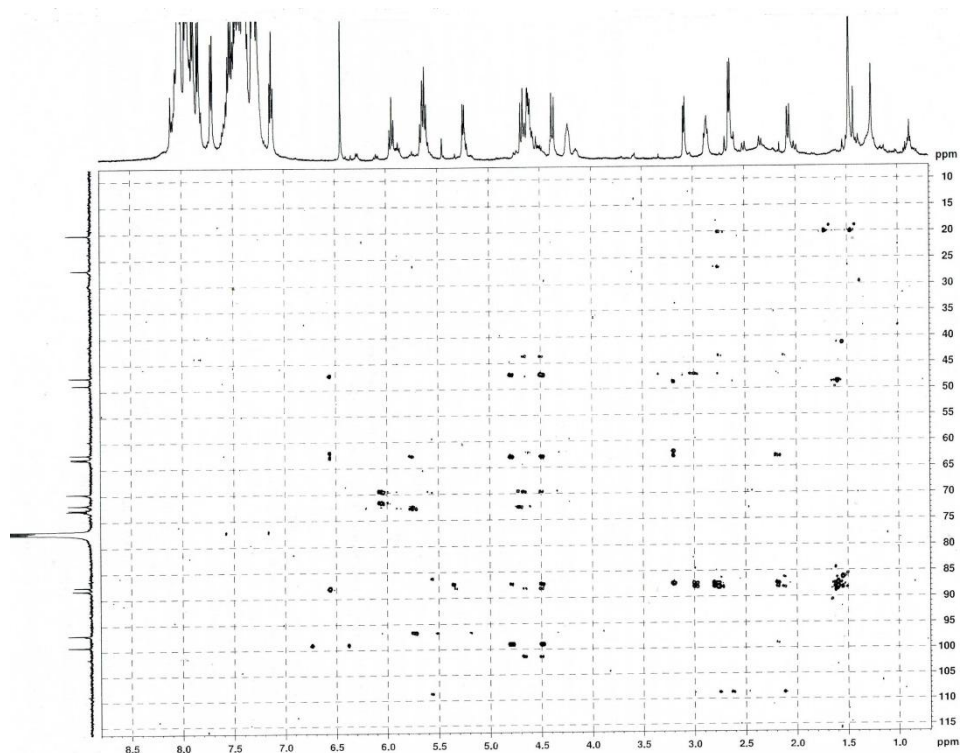


Figure S5. HMBC spectrum (500 MHz, CDCl_3) for compound **3**

HPLC data

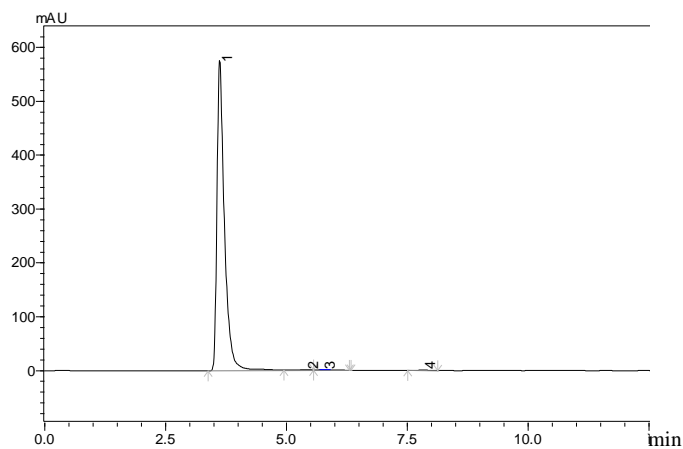


Figure S6. HPLC of PF. The Bondapak C18 column (300×3.9 mm, 10 μm) (Waters, USA); the mobile phase was MeOH -0.3N CH_3COOH = 90:10 (vol.%); the flow rate was 0.8 ml/min; the retention time was 3.61 min; UV detection was carried out at λ 254 nm; the purity was $96.0 \pm 0.5\%$.

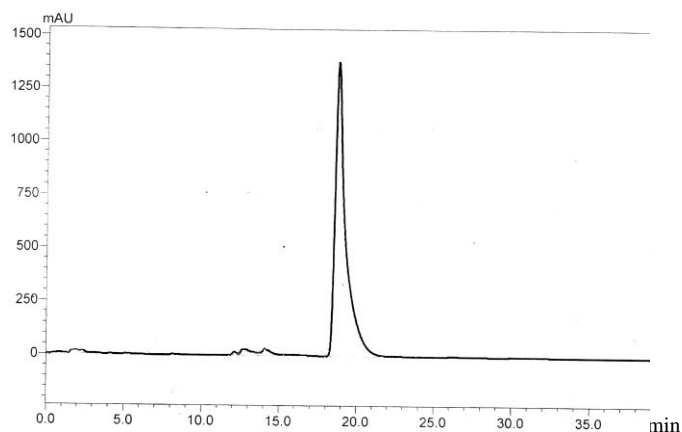


Figure S7. HPLC of compound **2**. Pursuit RX C18 column (250×46 mm, 5 μ m) (Agient, USA); the mobile phase is CH₃CN-H₂O = 85:15 (vol.%); the flow rate is 1.0 ml/min; the retention time was 18.71 min; UV detection at λ 225, 275 and 290 nm; the purity was 94.0±0.5%.

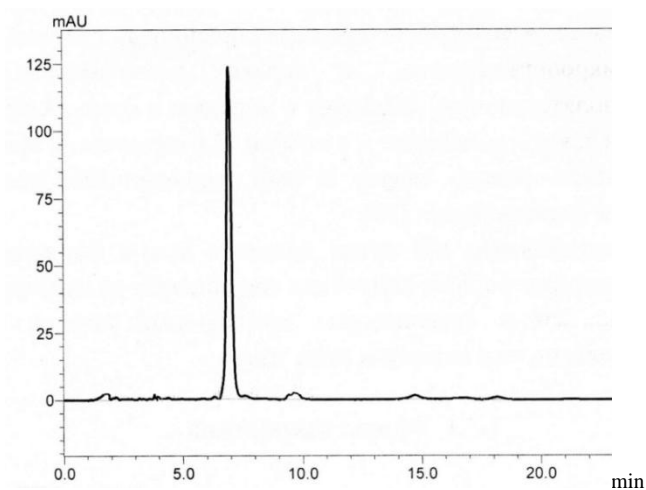


Figure S8. HPLC of compound **3**. Zorbax RX C18 column ((250×46 mm, 5 μ m) (Agient, USA); the mobile phase is CH₃CN-H₂O = 85:15 (vol.%); the flow rate is 1.0 ml/min; the retention time was 6.92 min; UV detection at λ 225, 275 and 290 nm; the purity was 95.0±0.5%.