

Cognitive-function-improving effects of *Tanacetum vulgare* hydroalcoholic extract in rats with scopolamine-induced amnesia

Borislava Lechkova^{1,2*}, Michaela Shishmanova-Doseva^{2,3}, Kalin Ivanov^{1,2}, Niko Benbassat^{1,2}, Stanislava Ivanova^{1,2}, and Zhivko Peychev⁴

¹ Department of Pharmacognosy and Pharmaceutical Chemistry, Faculty of Pharmacy, Medical University of Plovdiv, 4002 Plovdiv, Bulgaria

² Research Institute, Medical University of Plovdiv, 4002 Plovdiv, Bulgaria

³ Department of Pharmacology, Toxicology and Pharmacotherapy, Faculty of Pharmacy, Medical University of Plovdiv, 4002 Plovdiv, Bulgaria

⁴ Department of Medical Informatics, Biostatistics and E-Learning, Faculty of Public Health, Medical University of Plovdiv, 4002 Plovdiv, Bulgaria

* contact: borislava.lechkova@mu-plovdiv.bg

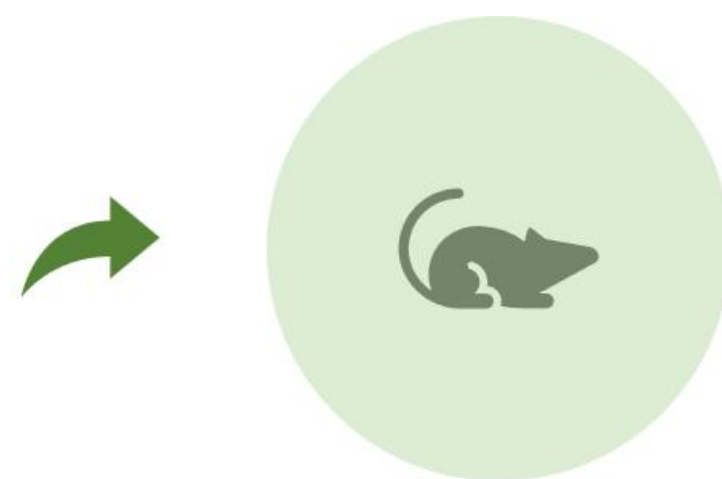
INTRODUCTION & AIM

In recent decades, phytochemicals have been the object of extensive research for their ability to improve or prevent cognitive decline [1,2]. *Tanacetum vulgare* L. (common tansy) is a rich source of various secondary metabolites (essential oil, sesquiterpenoids, and phenolic compounds) with anti-inflammatory, antioxidant, and antimicrobial activity [3,4]. However, research data about its cognitive effects are scarce.

The present study investigated the effect of two doses of *T. vulgare* hydroalcoholic extract (TVE) on learning and memory in an experimental model of scopolamine-induced amnesia in rats.



Tanacetum vulgare
extract



Scopolamine-induced
amnesia



Exploring the effect of
the extract on learning
and memory

METHOD

- Shuttle box apparatus for active and passive avoidance
- Fifty male Wistar rats, randomly divided into five groups:
 1. placebo (C-veh),
 2. scopolamine (C-Scop),
 3. glycerin+scopolamine (Gly-Scop),
 4. scopolamine+200 mg/kg TVE (T.vulgare-Scop 200),
 5. scopolamine+1000 mg/kg TVE (T.vulgare-Scop 1000).
- Measured behavioral parameters: the number of avoidances, the number of escapes, and the number of inter-trial crossings.

RESULTS

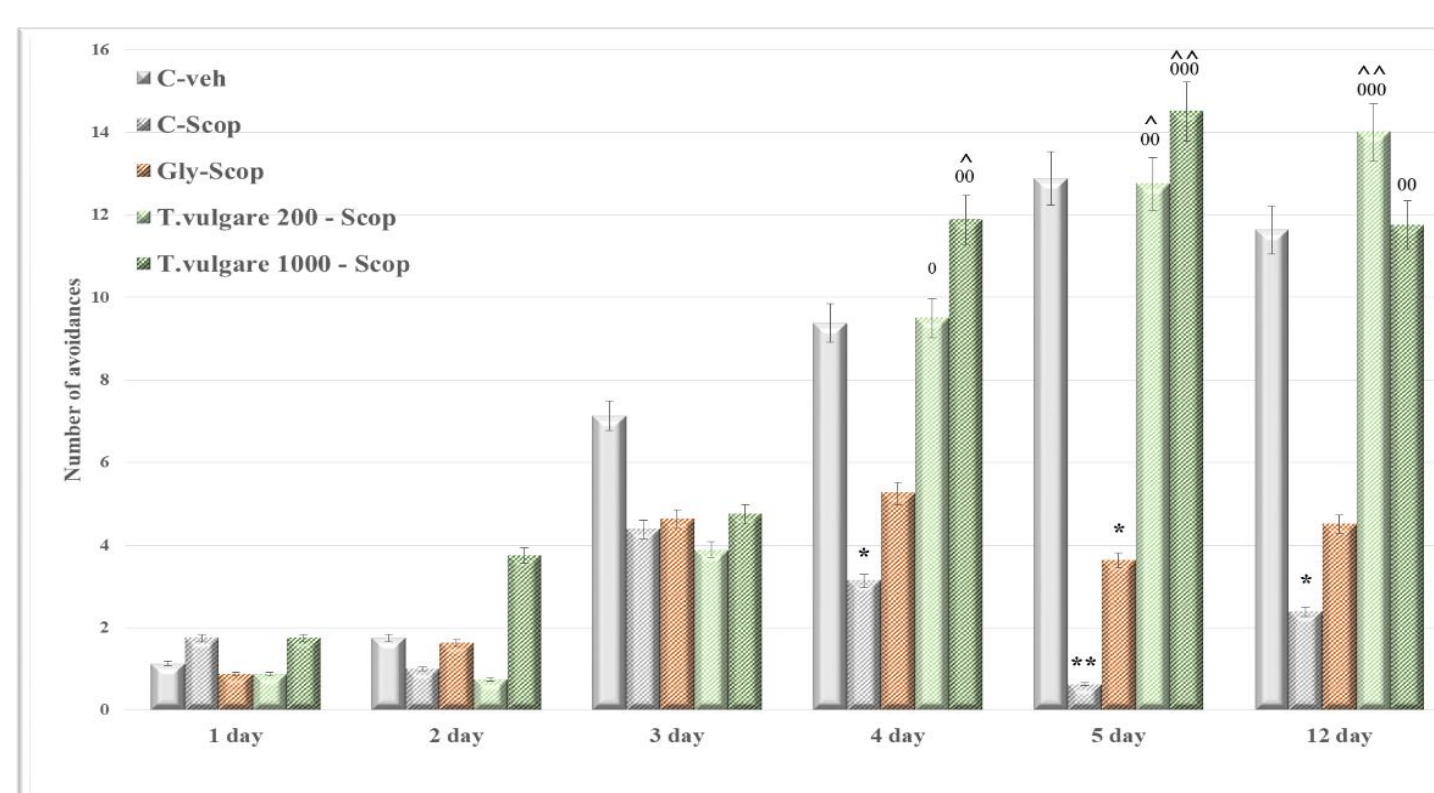


Figure 1. Effect of TVE on the number of avoidances (shuttle box). * $p < 0.05$, ** $p < 0.01$ – compared to the control group; ^o $p < 0.05$, ^{oo} $p < 0.01$, ^{ooo} $p < 0.001$ – compared to the C-Scop group; [^] $p < 0.05$, ^{^^} $p < 0.01$ – compared to the Gly-Scop group.

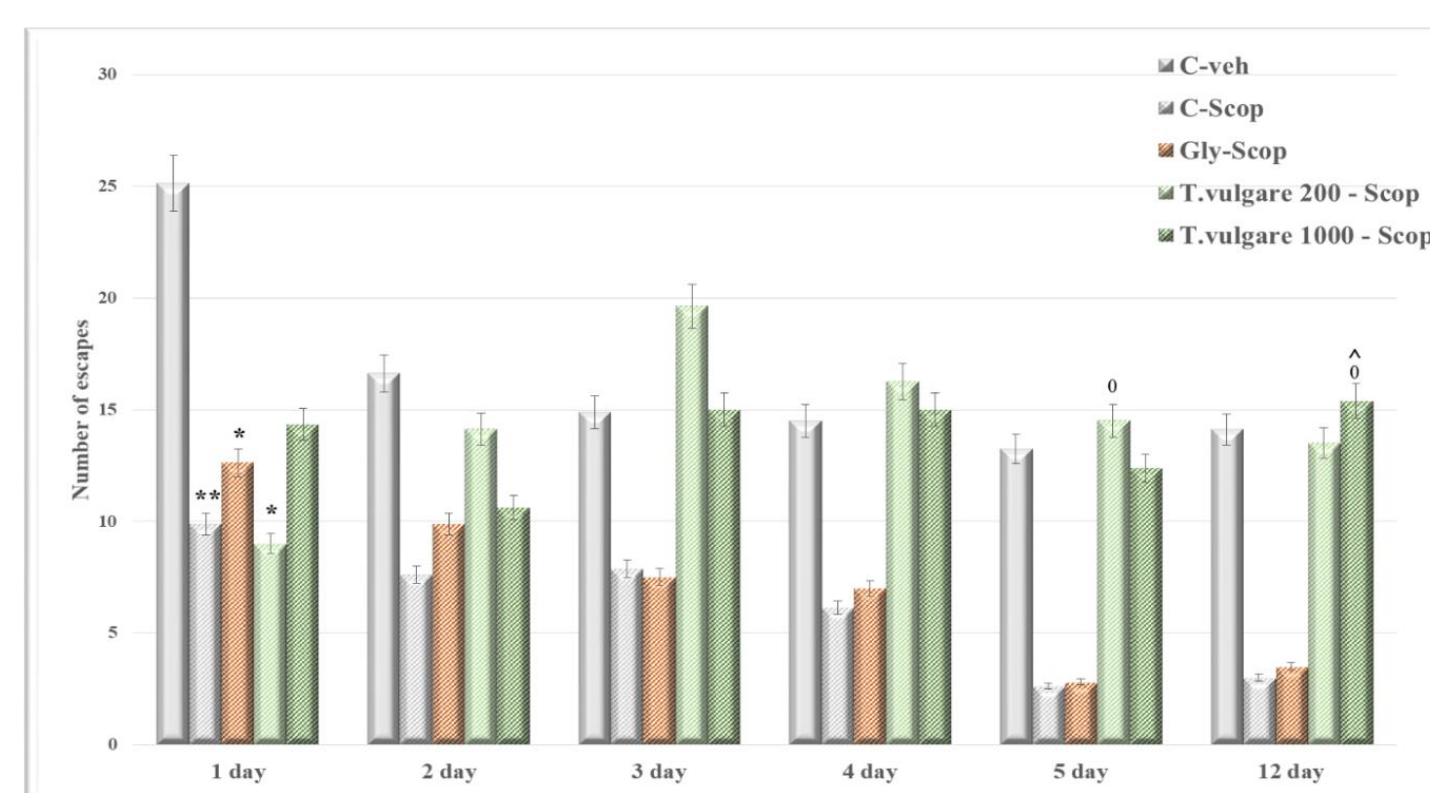


Figure 2. Effect of TVE on the number of escapes (shuttle box). * $p < 0.05$, ** $p < 0.01$ – compared to the control group C-veh; ^o $p < 0.05$ – compared to the C-Scop group; [^] $p < 0.05$ – compared to the Gly-Scop group.

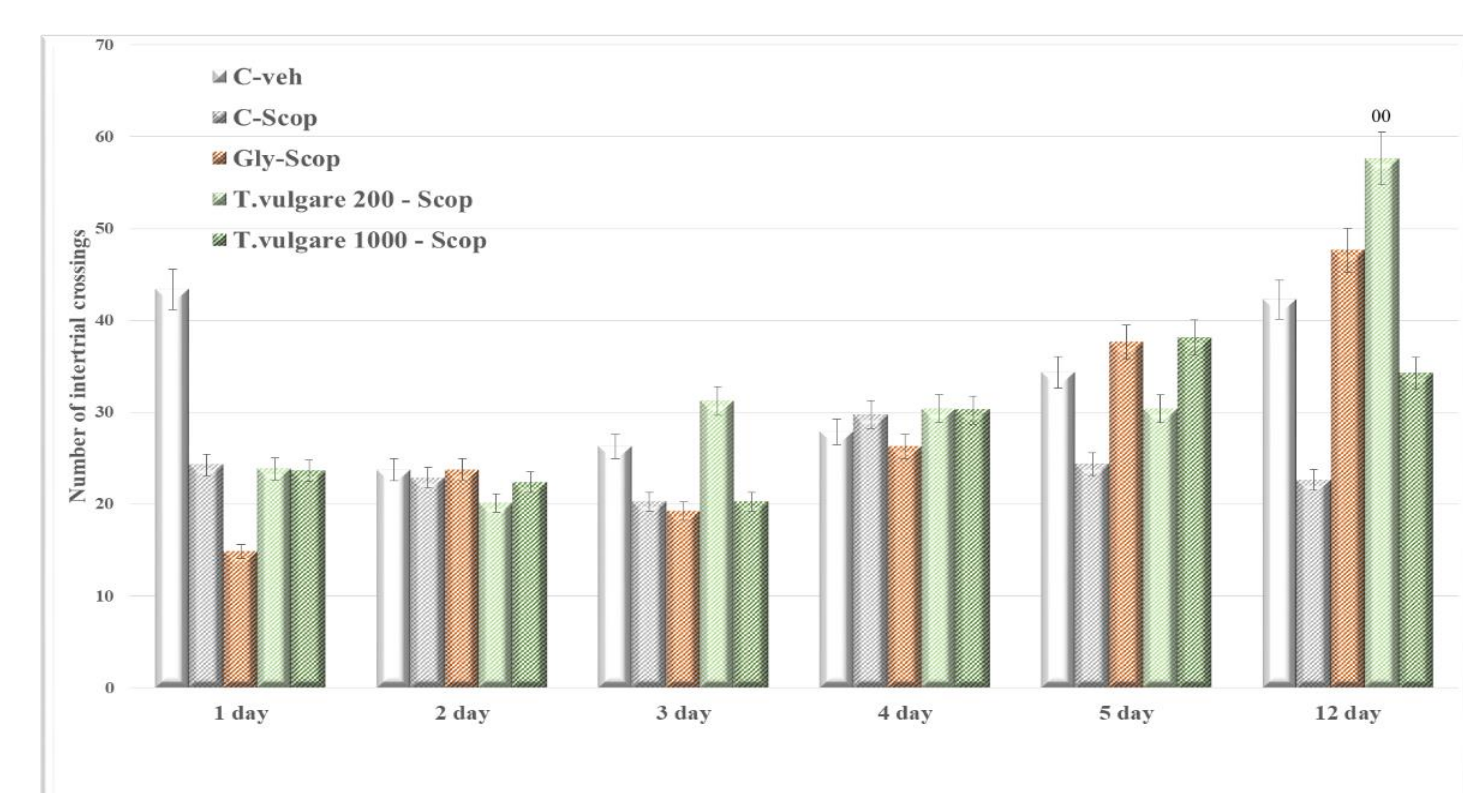


Figure 3. Effect of TVE on the number of inter-trial crossings (shuttle box). ^{oo} $p < 0.01$ – compared to the C-Scop group.

CONCLUSION

- These results reveal the beneficial effect of *T. vulgare* hydroalcoholic extract on cognitive function in rats with scopolamine-impaired memory.
- Further research is needed to explore the plant's potential as a nutrient supplement with cognitive-function-enhancing properties.

REFERENCES

1. Caruso, G.; Godos, J.; Privitera, A.; Lanza, G.; Castellano, S.; Chillemi, A.; Bruni, O.; Ferri, R.; Caraci, F.; Grosso, G. Phenolic Acids and Prevention of Cognitive Decline: Polyphenols with a Neuroprotective Role in Cognitive Disorders and Alzheimer's Disease. *Nutrients* **2022**, *14*, 819, doi:10.3390/nu14040819.
2. Narayana, D.B.A.; Joshi, H.; Tiwari, V.H.S. Overview of Approaches in Ayurveda for Neurological Health and Disorders. In *Ayurvedic Herbal Preparations in Neurological Disorders*; Elsevier, **2023**; pp. 41–88 ISBN 978-0-443-19084-1.
3. Babich, O.; Larina, V.; Krol, O.; Ulrikh, E.; Sukhikh, S.; Gureev, M.A.; Prosekov, A.; Ivanova, S. In Vitro Study of Biological Activity of *Tanacetum Vulgare* Extracts. *Pharmaceutics* **2023**, *15*, 616, doi:10.3390/pharmaceutics15020616.
4. Khatib, S.; Sobeh, M.; Faraloni, C.; Bouissane, L. *Tanacetum* Species: Bridging Empirical Knowledge, Phyto-chemistry, Nutritional Value, Health Benefits and Clinical Evidence. *Front. Pharmacol.* **2023**, *14*, 1169629, doi:10.3389/fphar.2023.1169629.

Acknowledgments: The authors gratefully acknowledge the support of Medical University of Plovdiv, project DPDP-07/2023.