

Cardioprotective Properties of *Trametes versicolor* mushroom Heteropolysaccharides in a Rat Model of Metabolic Syndrome

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Aim and Objectives of the research

Trametes versicolor (L.) Lloyd, commonly called Turkey tail, is a widespread type of white-rot fungal species that grows on many deciduous trees. Up to this point, *T. versicolor* has primarily been studied as an anticancer agent. Polysaccharides derived from its fruiting bodies showed immunostimulatory as well as cytotoxic activity towards cancer cells.

Recent *in vitro* and *in vivo* studies have shown that *T. versicolor* possesses many medicinal properties, such as antimicrobial, anti-diabetic, immunostimulant, AChE inhibitory and antioxidant activities.

The most important compounds for the biological activity of mushrooms are glucans. Among the isolated polysaccharides from *T. versicolor*, the most important one is krestin, exposing numerous beneficial systemic effects.

The most recent data undoubtedly showed that the administration of a *T. versicolor* may be of assistance in keeping glucose metabolism under control, but that it can also maintain a balance in blood lipid levels, with these beneficial health effects accomplished through the activation of antioxidant enzymes.

However, to date, no study has ever evaluated the effects of TV heteropolysaccharides (TVH) on cardiac function, especially in animals or patients with MetS.



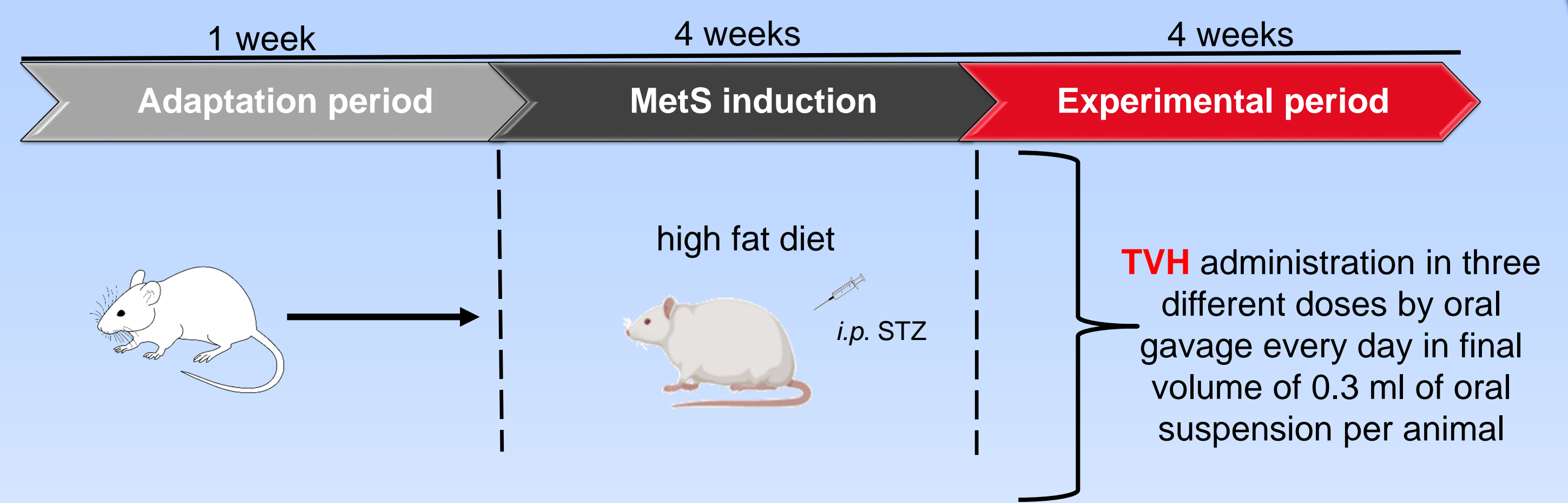
Morphological features of *Trametes versicolor*



Therefore, the aim of our study was to examine the potentially cardioprotective effects of TVH *in vivo* with special attention to antioxidative enzymes capacity, cardiac function and glycemic control in rats with metabolic syndrome (MetS).

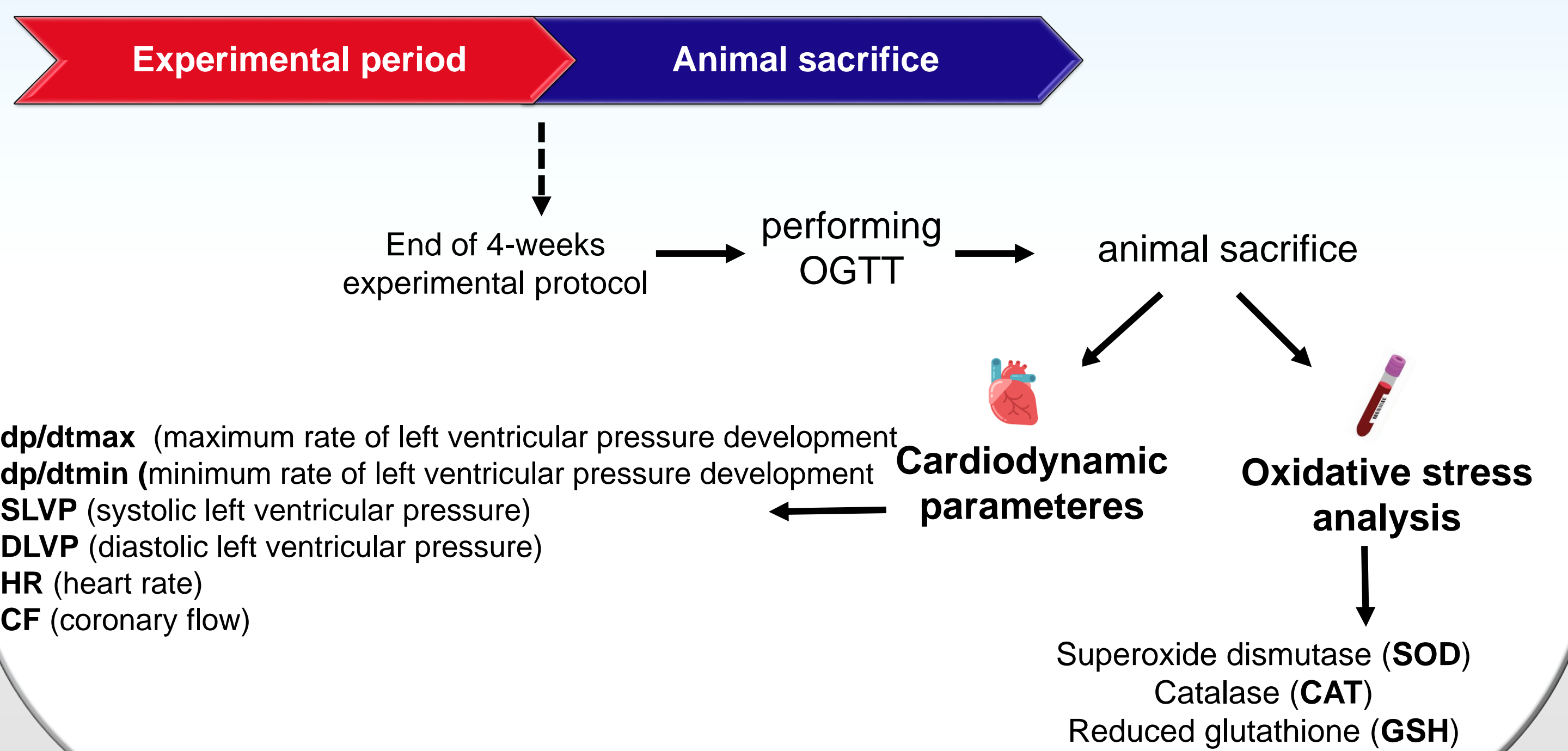
Materials and Methods of the research

EXPERIMENTAL PROTOCOL



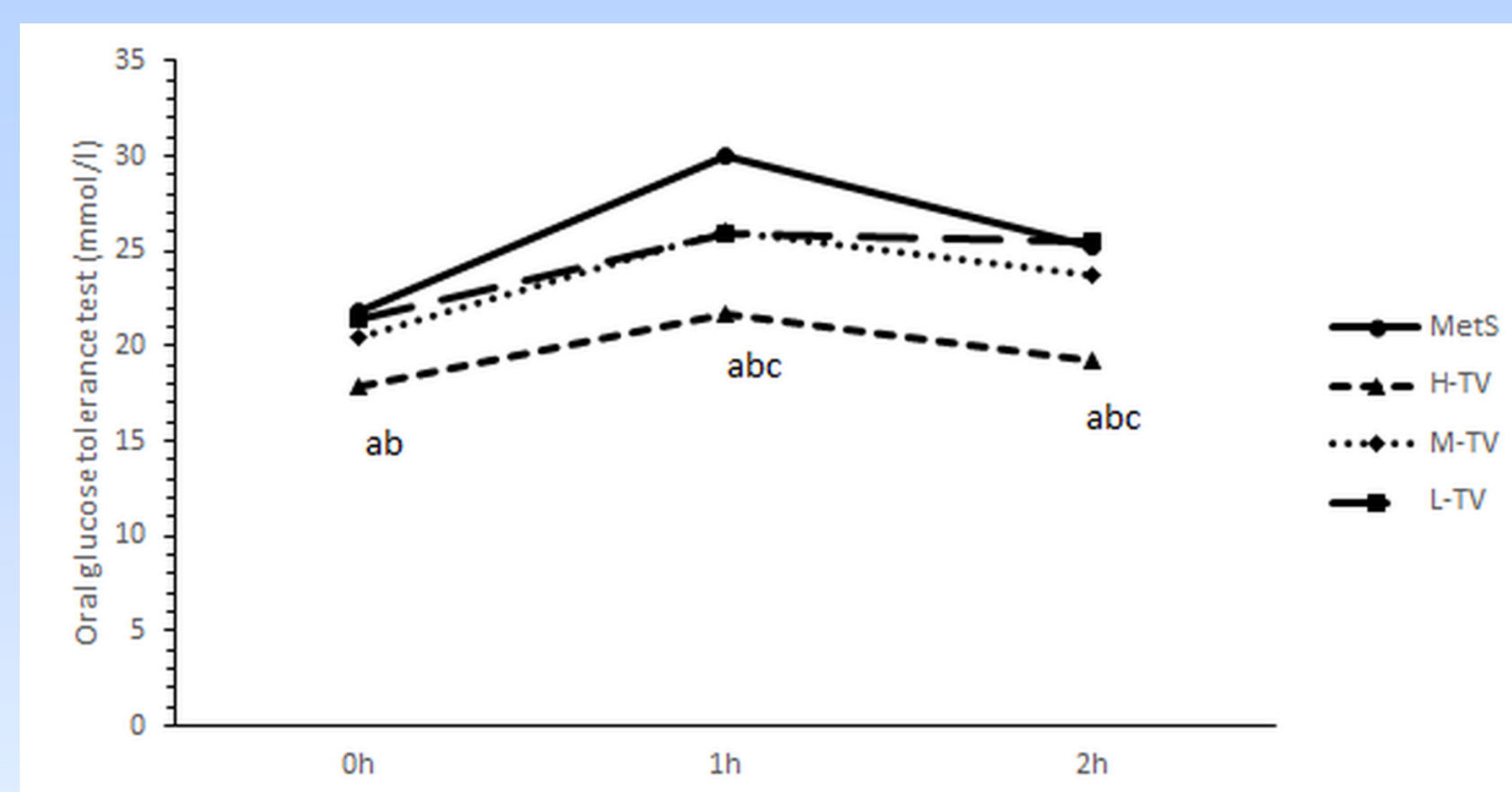
EXPERIMENTAL GROUPS

- 1. MetS** – untreated rats with MetS
- 2. H-TV** – rats with MetS treated with 300 mg/kg of TV (high dose)
- 3. M-TV** – rats with MetS treated with 200 mg/kg of TV (medium dose)
- 4. L-TV** – rats with MetS treated with 100 mg/kg of TV (low dose)



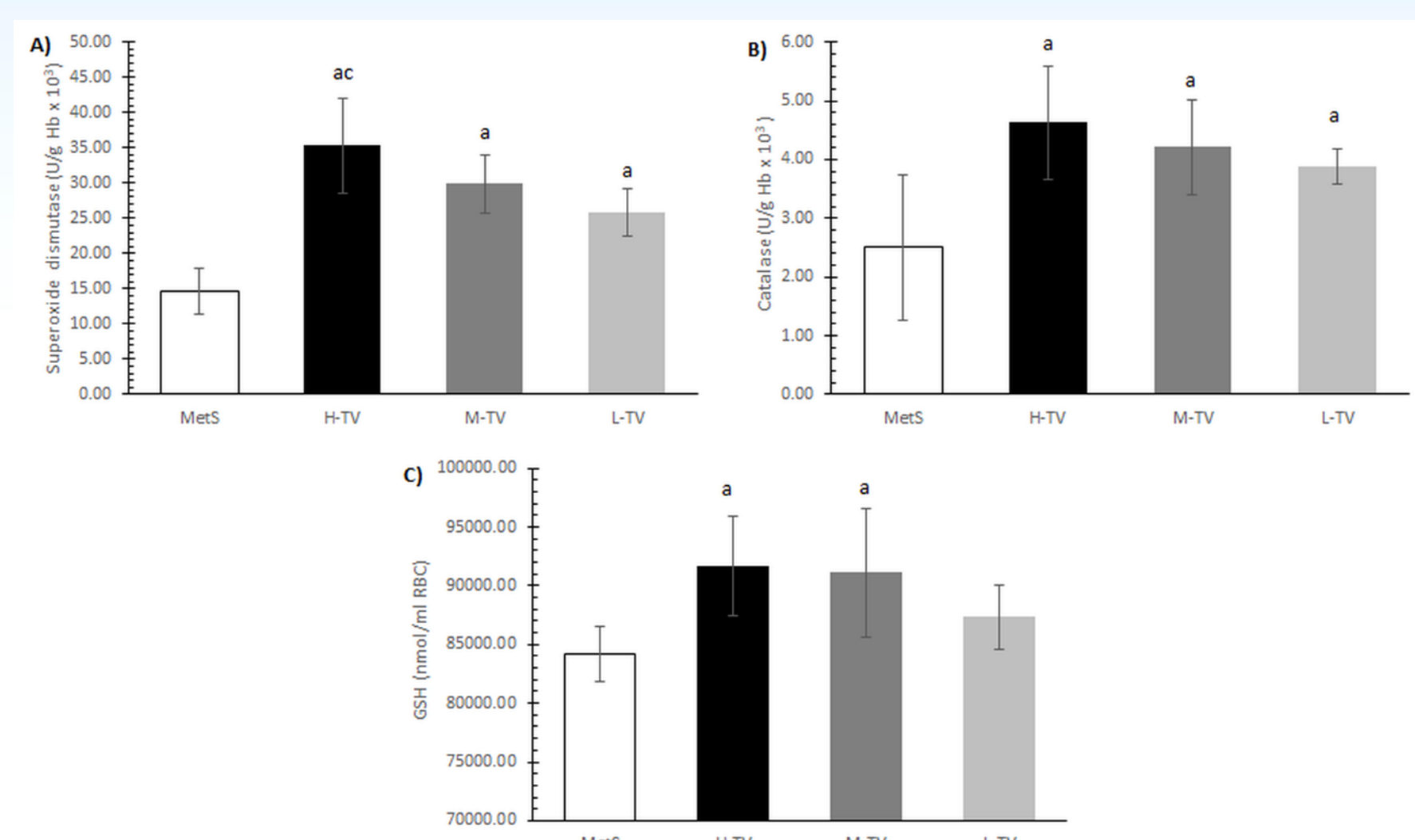
Main results

ORAL GLUCOSE TOLERANCE TEST



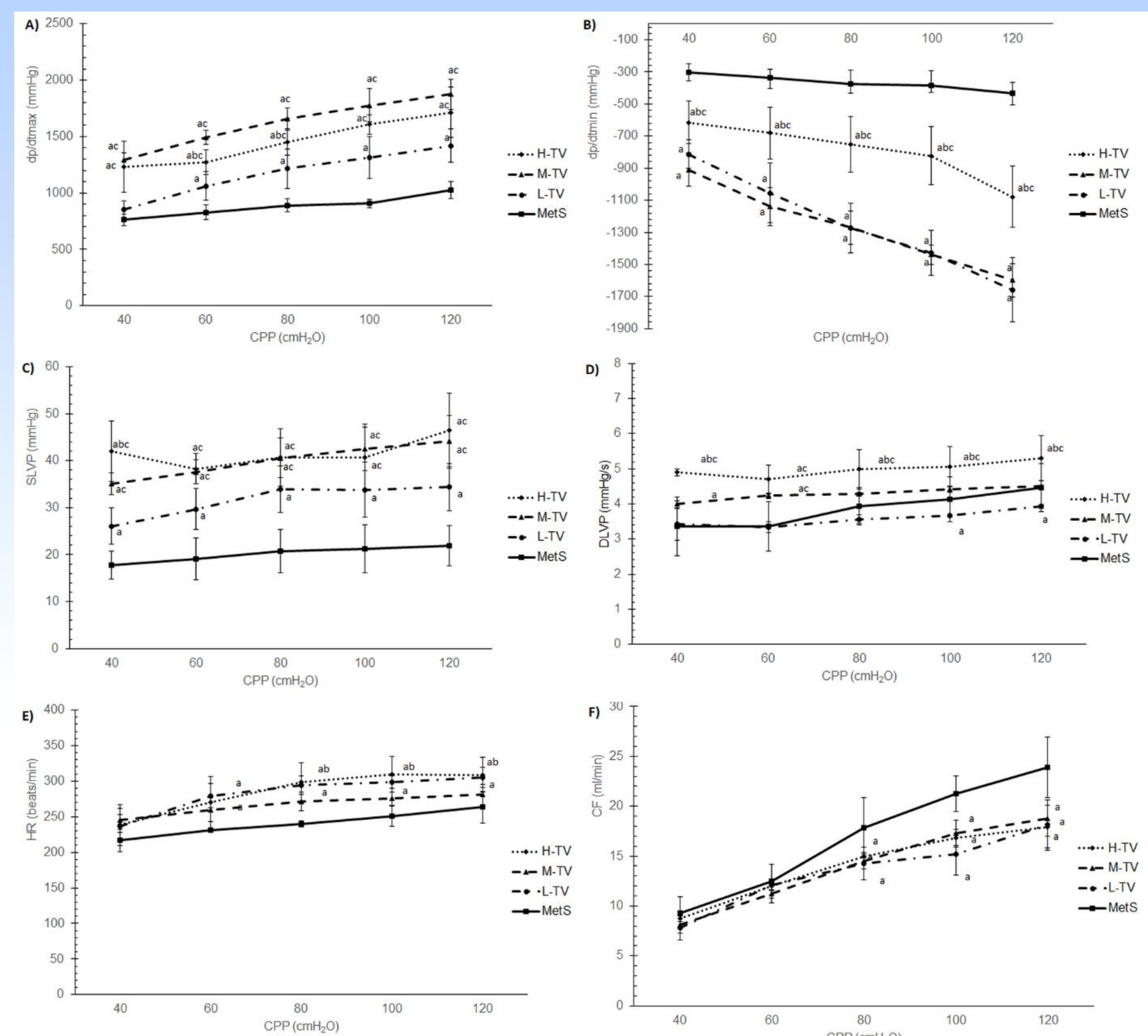
Statistical significance at the level $p < 0.05$: ^a to MetS; ^b compared to M-TV group; ^c compared to L-TV group.

ANTIOXIDATIVE ENZYMES



Statistical significance at the level $p < 0.05$: ^a to MetS; ^b compared to M-TV group; ^c compared to L-TV group.

CARDIAC FUNCTION



Statistical significance at the level $p < 0.05$: ^a to MetS; ^b compared to M-TV group; ^c compared to L-TV group.

Conclusions

For the first time, the results obtained in this study highlighted the cardioprotective potential of *T. versicolor* heteropolysaccharides both *in vivo* and *ex vivo* in the treatment of MetS. This was mediated by favorable effects on heart function, together with the hypoglycemic and antioxidative properties. The promising role of this mushroom in the management of MetS-related diseases is suggested. This study may be a starting point for additional preclinical and clinical research which would fully evaluate the effects and elucidate the exact mechanisms of cardioprotection by *T. versicolor* in MetS conditions.