To analyse the levels of an indirect marker of ROS-induced lipid peroxidation [i.e. malondialdehyde (MDA)] in both testes and the levels of matrix metalloproteinase-2 (MMP-2), matrix metalloproteinase-9 (MMP-9) and matrix metalloproteinase inhibitor-1 (TIMP-1) in the left testis after induction of varicocele and investigated the impact of micronised purified flavonoid fraction (MPFF) on these markers. Forty-nine adolescent (6-week-old) male Wistar rats were included in this study. The rats were divided into seven groups as follows: Group-1, control; Group-2, sham; Group-3, left varicocele-induced; Group-4, varicocele + varicocelectomy + MPFF-treated (for 4 weeks); Group-5, varicocele + MPFF-treated (for 8 weeks); Group-6, varicocele-induced and 4 weeks later, MPFF-treated (for 4 weeks); and Group-7, varicocele + varicocelectomy. MDA was measured in the tissues of both testes using the thiobarbituric acid reactivity method. The ELISA method was used for the quantification of MMP-2, MMP-9 and TIMP-1 in the left testicular tissue. The levels of MDA were significantly higher in the varicocele group than in the other groups. The MDA levels in the left testicular tissues of Group-7 were significantly higher than those of Group 4 (P = 0.03). In the varicocele group, the MMP-2 and MMP-9 levels decreased, whereas the levels of TIMP-1 increased. The tissue levels of MMP-2 in Groups 4, 5 and 7 were significantly higher than those in Group 1 (P < 0.05).