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1. BACKGROUND

Recently, **cancer research** has focused on the search for new and more effective **antitumor agents of natural origin** that can activate multiple defense mechanisms and selectively damage transformed cells.

Medicinal plants have a number of **biologically active secondary metabolites** with the ability to influence various stages of cancer development.

2. AIM

The goal of this research was to assess different antitumor mechanisms of ethanolic extracts of 18 Lamiaceae species traditionally used in Serbian folk medicine and cuisine, as well as their genotoxic potential towards HCT-116 (colorectal cancer) cells.

3. MATERIAL AND METHODS

The viability of treated HCT-116 cells was assessed by MTT assay.

The production of reactive oxygen species (ROS) by the treated HCT-116 cells was determined using NBT assay.

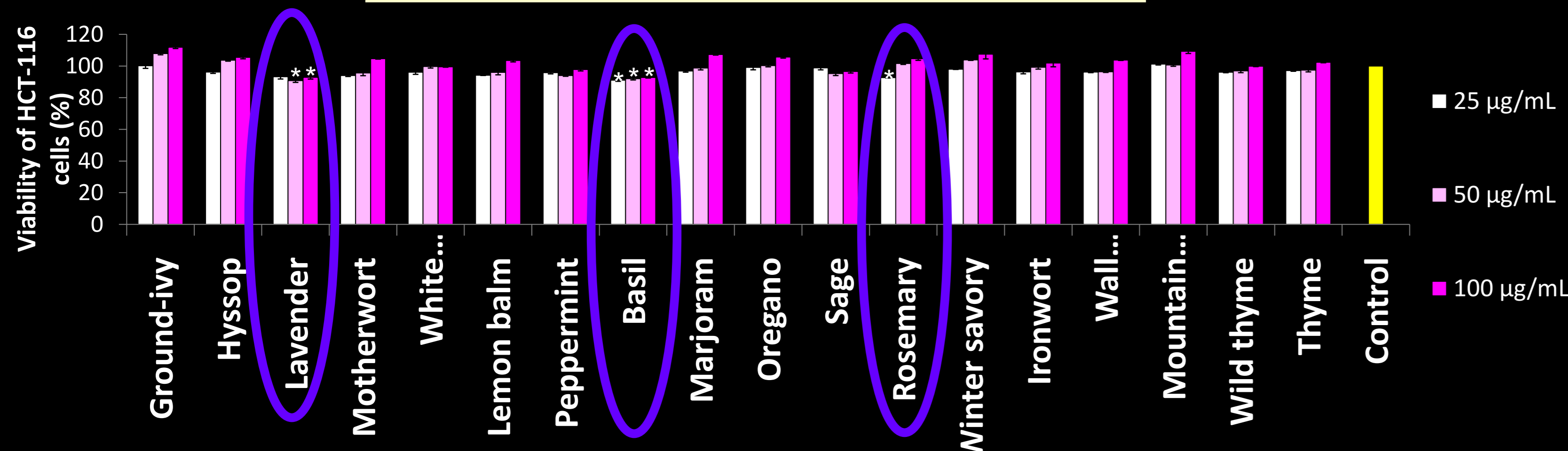
The production of nitric oxide (NO) by the treated HCT-116 cells was evaluated using Griess assay.

The **genotoxic activity** of the extracts on HCT-116 cells was tested in Comet assay, using etoposide as positive control.

4. RESULTS

- Lavender, basil, and rosemary **inhibited the proliferation of HCT-116 cells**, significantly lowering their viability (Fig. 1).

Fig. 1. The viability of HCT-116 cells

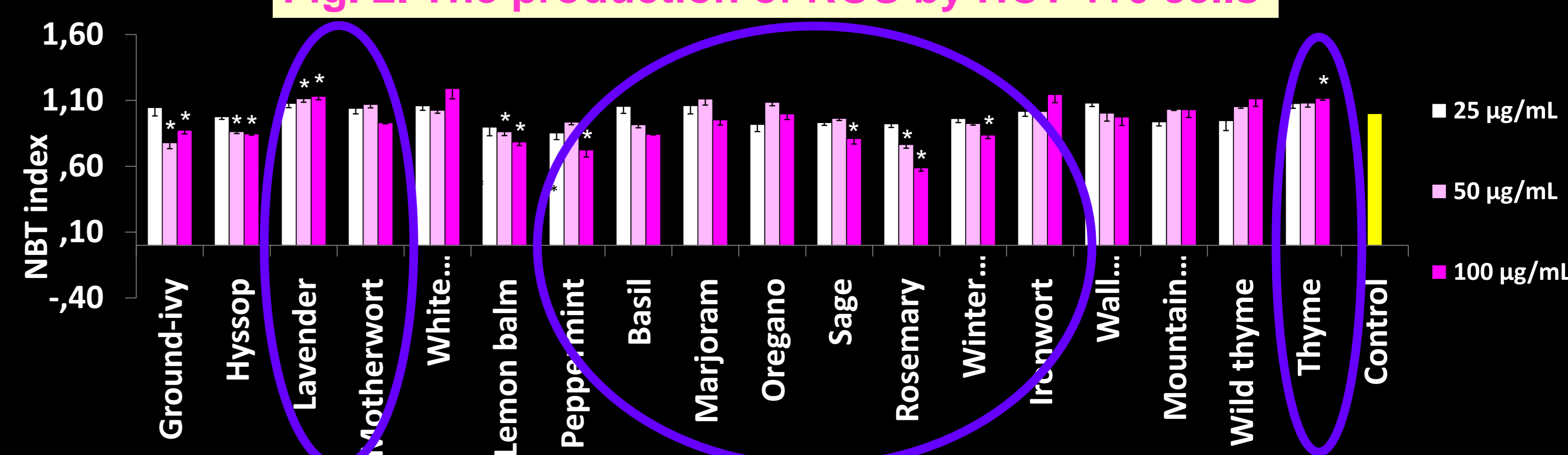


- Lavender and thyme extracts displayed a **significant increase in ROS production**, whereas ground-ivy, hyssop, lemon balm, peppermint, basil, rosemary, sage, and winter savory have **significantly lowered their production** (Fig. 2).

5. CONCLUSIONS

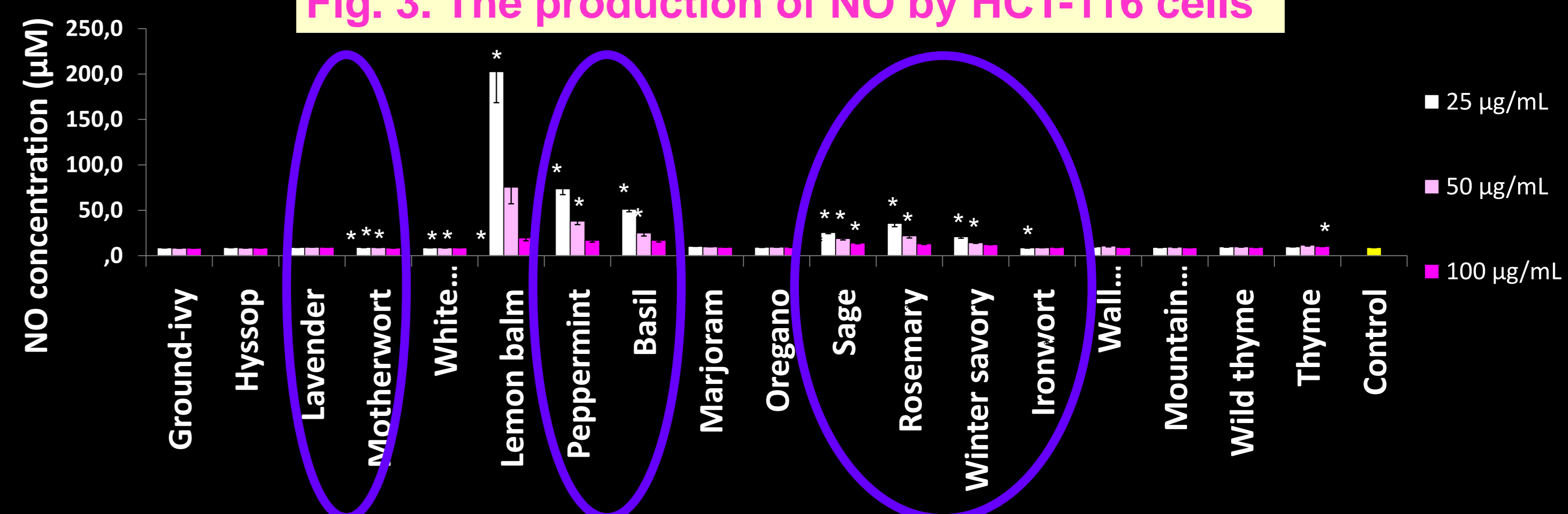
These traditionally valued plants might act as potent antitumor agents by modulating the proliferation and production of ROS and NO by cancer cells, as well as by expressing significant genotoxic properties towards cancer cells.

Fig. 2. The production of ROS by HCT-116 cells



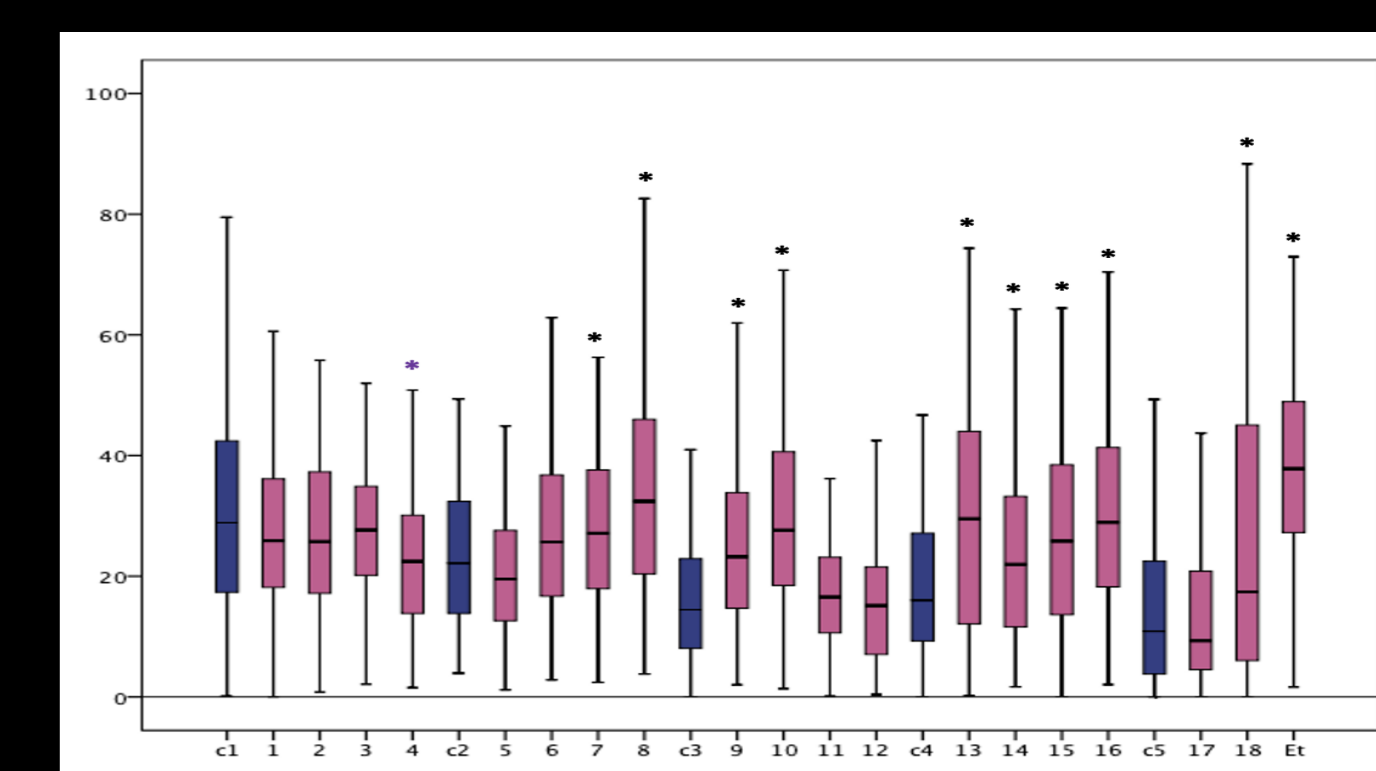
- Lavender, motherwort, peppermint, basil, rosemary, sage, winter savory, ironwort, and thyme have **significantly increased the production of NO** (Fig. 3)

Fig. 3. The production of NO by HCT-116 cells



- Motherwort (3), peppermint (7), basil (8), marjoram (9), oregano (10), winter savory (13), ironwort (14), wild thyme (15), thyme (16), and mountain germander (18) expressed **genotoxic potential towards HCT-116 cells**, while only basil had genotoxic activity statistically similar to etoposide (Fig. 4).

Fig. 4. The genotoxic activity



- The obtained results are in accordance with our previous findings, which indicated that these extracts have antigenotoxic and genoprotective activities towards normal cells.

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