Dear authors,

Thank you for the effort that you put into the revision of your manuscript; it is much improved and merits recommendation. However, before I can do so, some further minor revisions are required.

Dear Karen,

We thank you a lot for your revision of the manuscript. We corrected directly in the manuscript the English errors and clarified paragraphs. Please, see below our response and associated corrections for your specific questions.

- line 248: the method described here is very difficult to understand and requires some clarification

We probably haven't been clear enough in the previous version of the manuscript. This method is a basic method used everyday in parasitology lab. It helps to separate all the elements remaining from digestion (vegetable fragments) that will sediment from parasite eggs that will float, as they are lighter than the flotation solution, and stick to the coverslip. One specific requirement if we centrifuge the tube is to use a basket centrifuge (otherwise the coverslip will not stay on the top of the tube during the centrifugation; see the picture).

We have now rephrased the section as follow [L274-279]: “We also checked for the presence of low abundant parasite propagules with a “control slide”. We prepared this control slide with a 14mL tube filled with the remaining solution until a meniscus is formed. We covered the tube with a coverslip and centrifuge the tube with a basket centrifuge (5 min at 1200 rpm) to help propagules to rise and stick on the coverslip. After centrifugation, the coverslip was transferred on a microscope slide for microscopical observation.”

- line 387: I don't believe that you justify separating the two sites at Cerces; you go from talking about 3 locations to 4 locations.

We added [L386-389]: In the Cerces Massif, we considered independently the two sectors of the Aiguillette de Lauzet and the Montagne de l’Oule that correspond to distinct and distant pastures where sheep herds never met and where ibex feces were independently collected on these two pastoral units.

- Figure 3: I think that there is a problem with the haplotype colours for T. colubriformis

We corrected the color accordingly.

- line 683: It is not obvious why males are 'certainly more susceptible to parasitism'. This is should expanding on slightly.

We added [L677-687]: “Sexual parasitism towards males is commonly observed in vertebrates and ungulates in particular (Klein, 2000; Martínez-Guijosa et al., 2015; Oliver-Guimerá et al., 2017, but see Beaumelle et al., 2021 and Bourgoin et al., 2021). This parasitism towards males is generally explained by both hormonal and behavioral differences between the two sexes. Generally, males tend to allocate more energy to the development of traits influenced by testosterone, such as secondary sexual characteristics (e.g. the length of horns in ungulates) or courtship displays (e.g. male aggression for mating opportunities). It is important to note that while testosterone is necessary for the development of these secondary sexual characteristics in males, high levels of the testosterone have also been linked to an altered immune system (Klein, 2004), leading to increased parasitism.”

- line 700: A clarification of the notion of 'indirect transmission' is required

We agree with your definition; indirect transmission means transmission of parasite via the environment. We reorganized the paragraph to avoid the confusion between indirect transmission and the contamination of the environment by anthelmintic which are two different mechanisms which could lead to the contamination of ibex by resistant nematodes.

We completed the paragraph [L704-721]: “The presence of anthelmintic resistant nematodes in ibex is most likely explained by the indirect transmission of resistant nematodes from sheep to ibex through the deposit of infected feces by sheep on pastures. The large number of shared β-tubulin ASVs between sheep and ibex and the high overlap between nemabiomes tend to confirm this hypothesis (Figure 2c, Figure 3). This is also in accordance with other studies investigating nematode parasites exchange at the interface between wild and domestic ungulates (Beaumelle et al., 2022; Cerutti et al., 2010; Laca Megyesi et al., 2019). Another pathway for the contamination of ibex by resistant nematodes could be the sublethal exposure of the free-living stages of nematodes to anthelmintic residues excreted in the environment by treated sheep, which can select for anthelmintic resistance in situ (Dimunová et al., 2022). Whereas sheep are generally treated just before their ascent to the mountain pastures, excretion of anthelmintic drugs via sheep feces can occur during several days after the administration and the molecule degradation last days, or even months (Kolar et al., 2006). Unfortunately, the level of drugs in the environment, their persistence and their spread in grazed mountainous area are totally unknown. Environmental circulation of anthelmintic residues should be investigated in further studies to understand its incidence on the presence of resistant nematodes in wildlife.”

- line 726: I wonder whether a viable alternative hypothesis might be that antihelminthic drug residues in the environment are high enough to maintain resistance in ibex?

We agree and we have added this alternative hypothesis [L733-739]: “In addition, the position of resistant mutant strains detected at the periphery of haplotype networks (Figure 3) supports the lack of benzimidazole resistant reversions and relatively recent selection of benzimidazole resistance. The recent selection of resistance could result from repeated use of benzimidazole and also perhaps from the presence of

anthelmintic drug residues in the environment which maintain a selection pressure for gastro-intestinal nematodes (Dimunová et al., 2022)”