Reviewer’s report

Title: Urine alkalization facilitates uric acid excretion.

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Reviewer: Lesley Doughty

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The manuscript is improved with all of the issues addressed however there remain some sentences/paragraphs that are still very difficult to understand. If clarified, the flow of the involved sections would be much improved. These changes should be considered minor essential revisions.

For instance:
In the abstract this sentence could be improved by restating as follows:
Uric acid and excreted urine pH retained a linear relationship, where uric acid excretion increased from 302 mg/d at pH 5.9 to 413 mg/d at pH 6.5 despite the fact that the alkali diet contained a smaller purine load than the acid diet. In the discussion the following sentence might be clearer as follows (assuming I understand its meaning):
The significance of this finding is that although the purine content was less in the alkaline diet compared to the acid diet, the transportable proportion of uric acid (in conjugate base) (PKa=5.35) was larger in alkaline urine compared with acid urine. These data demonstrate that excretion of uric acid is suppressed in acidic urine.

In the discussion- if the authors want to include the paragraph below, then it should be rewritten to improve clarity. I cannot understand it.
According to the hypothesis of Ames, Cathcart, Schwiers and Hochstein. (1981)[9],
the mutation of uricase leading to complete loss of function which only occurred in the great apes and human beings would have caused a large increase in both life-span and brain size, because of evolutionary advantage of antioxidant functions of uric acid. In order to establish the antioxidant functions of uric acid, the renal reabsorption and excretion rates are of considerable importance for keeping urate concentration in blood in humans stable. Actually, in man, more than 90% of the urate is actively reabsorbed.

Taking into account of pH dependent reabsorption mechanism found in this study, we think that this characteristic brings a beneficial effect of uric acid to human beings by maintaining serum uric acid concentration high enough to eliminate an aversive effect of reactive oxygen species but low enough to prevent crystallization of uric acid in the joint cavity.
Again, the manuscript is improved but still requires some editing for clarity.