

Reviewing the bread and butter of CoReMa, Cooking Recipes of the Middle Ages

CoReMA: *Cooking Recipes of the Middle Ages*. <http://gams.uni-graz.at/corema> (Last Accessed: 2021-04-31). Reviewed by  Helena Bermúdez Sabel (Université de Neuchâtel), [helena \[dot\] bermudez \[at\] unine \[dot\] ch](mailto:helena@unine.ch).

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Abstract

CoReMa, Cooking Recipes of the Middle Ages is an ongoing project whose method involves a semantically annotated, conservative edition of medieval manuscripts containing cooking recipes. With a rigorous philological approach and the aid of semantic web technologies, CoReMa's method aims at teasing out the textual relations between different recipe collections, even enabling the comparison between manuscripts in different languages. Its semantic model covers many and very heterogeneous aspects of the transmission of cooking knowledge including, just to give an example, the treatments of a condition or illness. CoReMa is an ambitious project and food historians will not be the only scholars that will benefit from such a comprehensive (and intuitive) resource.

Introduction^{*}

Collections of cooking recipes have a rich textual tradition in medieval Europe that goes beyond the famous compilations of *De re coquinaria*,^{*} and *CoReMa, Cooking Recipes of the Middle Ages* provides a rigorous method to tackle its complexity. With the objective of pursuing an in-depth analysis of the transmission and interrelation of medieval cooking recipes, CoReMa proposes an interdisciplinary approach that produces a semantically annotated digital scholarly edition (Klug and Lauriaux 2020).

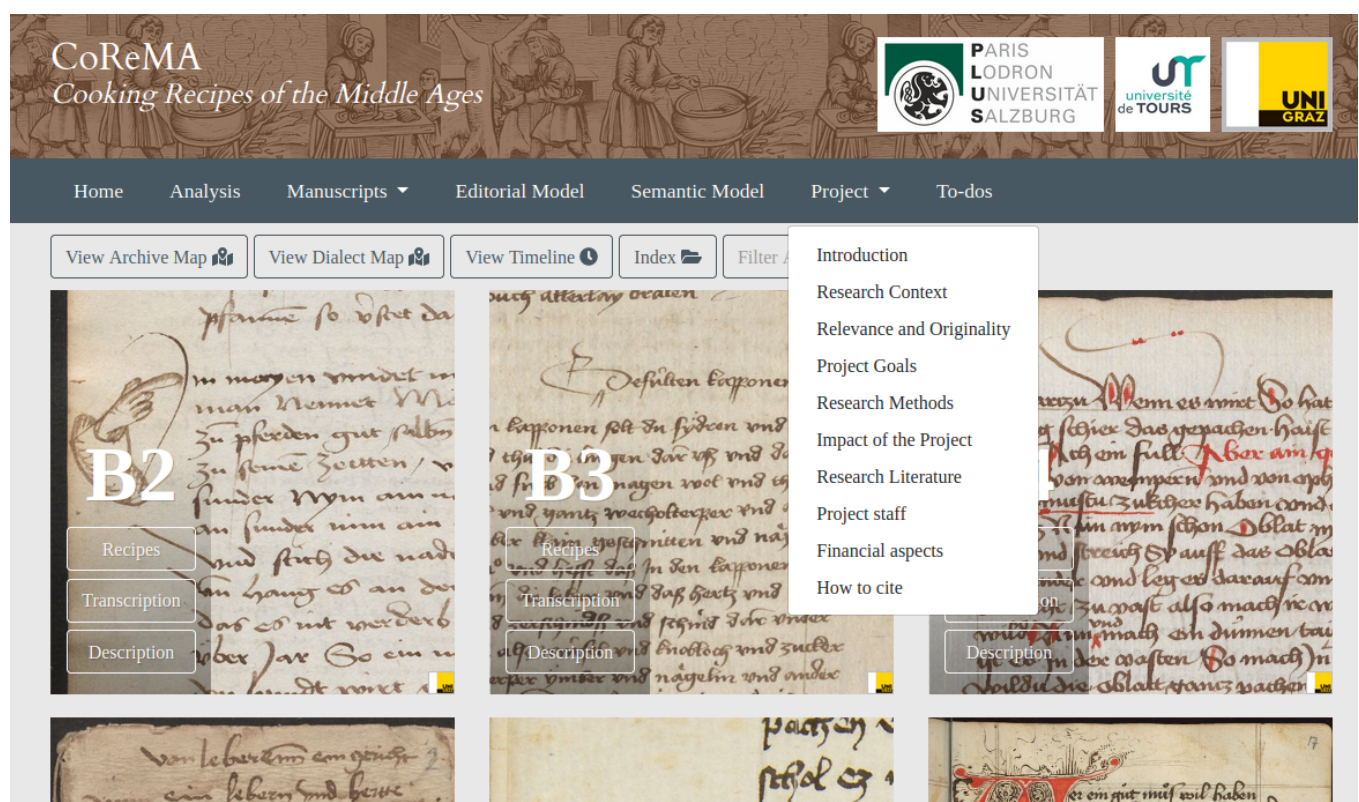
At the time of writing, the project holds the edition of fifteen manuscripts from the Late Middle Ages in several German dialects. Thus, this review concerns the edition of the German Cooking Recipe Collections, although the project has a much larger scope. CoReMa defends a cross-linguistic approach as one of the defining features of this project in comparison to previous national-based initiatives. Therefore, either the addition of other languages or, at least, the enrichment of the German materials with the corresponding references to other textual traditions is expected considering the overall goals of the project.

There are a few resources that are of invaluable help for researchers in food history (or food historiography). One of the resources which has received the most attention outside specialised circles^{*} is *The Sifter* (Wheaton 2020), a database of recipes, ingredients, and cooking techniques retrieved from more than 7,000 bibliographic works. Another relevant resource is *The Food Timeline* (Olver 2015). On the one hand, this resource provides information about when foods were first introduced (visualised, as expected, in a graphical timeline). On the other hand, this information is complemented with historic recipes using those

foods, together with various food-related topics such as historic food prices, historic menu collections, adaption of old recipes, and other information about culinary research. This database provides both scholarly sources and ‘popular’ ones from outside academia (such as famous cooking blogs or chefs’ websites).^{*} Although all these resources somehow cover the same historical and geographic framework as CoReMa, in the sense that Medieval Europe is well represented in both databases, the project being reviewed provides a philological approach not shared by the aforementioned resources. Thanks to the scholarly edition of the recipes, the codicological analysis of the manuscripts that contain them and the phylogenetic study of these sources, it is possible to obtain an exhaustive knowledge on the socio-historical and cultural factors that brought about those recipes. This comprehensive analysis can hardly be achieved by more generic endeavours.

Considering that CoReMa’s work is still in progress, I will dedicate a section to briefly discuss the project and its overall goals in relation to its current status (see section ‘Presentation of the project and its status’). ‘CoReMa’s method: a transdisciplinary approach’ presents an overview of the methodology and the section ‘Interface’ discusses the main functionalities of the graphical user interface. The review ends with some final remarks that mainly expand on the scholarly contribution of this project (see section ‘Conclusion’).

Presentation of the project and its status



The front page of CoReMa including the menu items that describe this project.

The website of the project is very well organised. The menu items take the user to the relevant pieces of information that can be consulted before exploring a project’s contents. CoReMa provides comprehensive documentation, both from the perspective of its conceptualisation and also its implementation (see Fig. 1).

The information related to the agents and agencies behind this project is accessible, clear and well-organised. CoReMa stems from the international cooperation between the Centre for Information Modelling - Austrian Centre for Digital Humanities of the University of Graz (ZIM-ACDH) and the Centre for Advanced Renaissance Studies of the University of Tours. The principal investigators are Helmut W. Klug, who leads the Austrian participation, and Bruno Laurioux, who is in charge of the French team. The project is funded by the Agence Nationale de la Recherche (ANR) and by the Austrian Science Foundation (FWF). Project start and end dates are not explicitly mentioned on the website. However, an online search for the grant number showed that the project is being funded from March 2018 until October 2021.

The overall goal of CoReMa is to gain new knowledge on cooking traditions from a cross-cultural perspective by studying how medieval European cooking recipes were transmitted. To achieve it, the core of the methodology is the scholarly digital edition of the recipes. The texts of this edition are semantically annotated in order to tease out the answers for the overall research question: what were the food habits in Medieval Europe. The contents of this annotation are exploited thanks to different search functions. At the moment, it is possible to filter the recipes according to different criteria, like period or dialects. A search by ingredient(s) is also enabled. These search functions make it possible to trace the distribution of certain recipes and ingredients. Accordingly, the tool is already a useful resource to shed light on certain gastronomical trends even at this stage of the project, where all manuscripts have not yet been edited. Besides its use by a specialised public, any person interested in cooking will enjoy browsing the contents of the project and learning the particularities of medieval cuisine.

At the time of writing, we can access the edition of fifteen manuscripts, all of them pertaining to the German Cooking Recipe Collections. For these witnesses, a curated text is provided and, for most of them, the structural and semantic components of the texts are also identified, like the categorisation of ingredients, instructions or tools. A useful resource to evaluate the state of the project is the to-do list accessible from the main menu.^{*} This list gives us a quick overview of the state of the corpus in terms of its development. The manuscripts whose edition is planned are listed and it is clear which ones have already been incorporated to the website (about a fourth of the collection). What is unclear to a user is the criteria for the selection of sources. Considering the goals and the description of the project provided, it is to be expected that their scope includes every manuscript of cooking recipes inside the pertinent chronological framework. However, no information is given about how the source compilation was done.

Besides giving an overview of the state of the collection in terms of progress, the to-do list contains tasks related to other development areas like the graphical user interface, or aspects of the analysis that still need to be implemented. With the complete edition of a number of witnesses and the implementation of a faceted search, we have a fair glimpse at what will be the final product. The most relevant functionality that is yet to be implemented at the moment of writing is related to intertextual relations between recipes and the analysis of recipes migration.

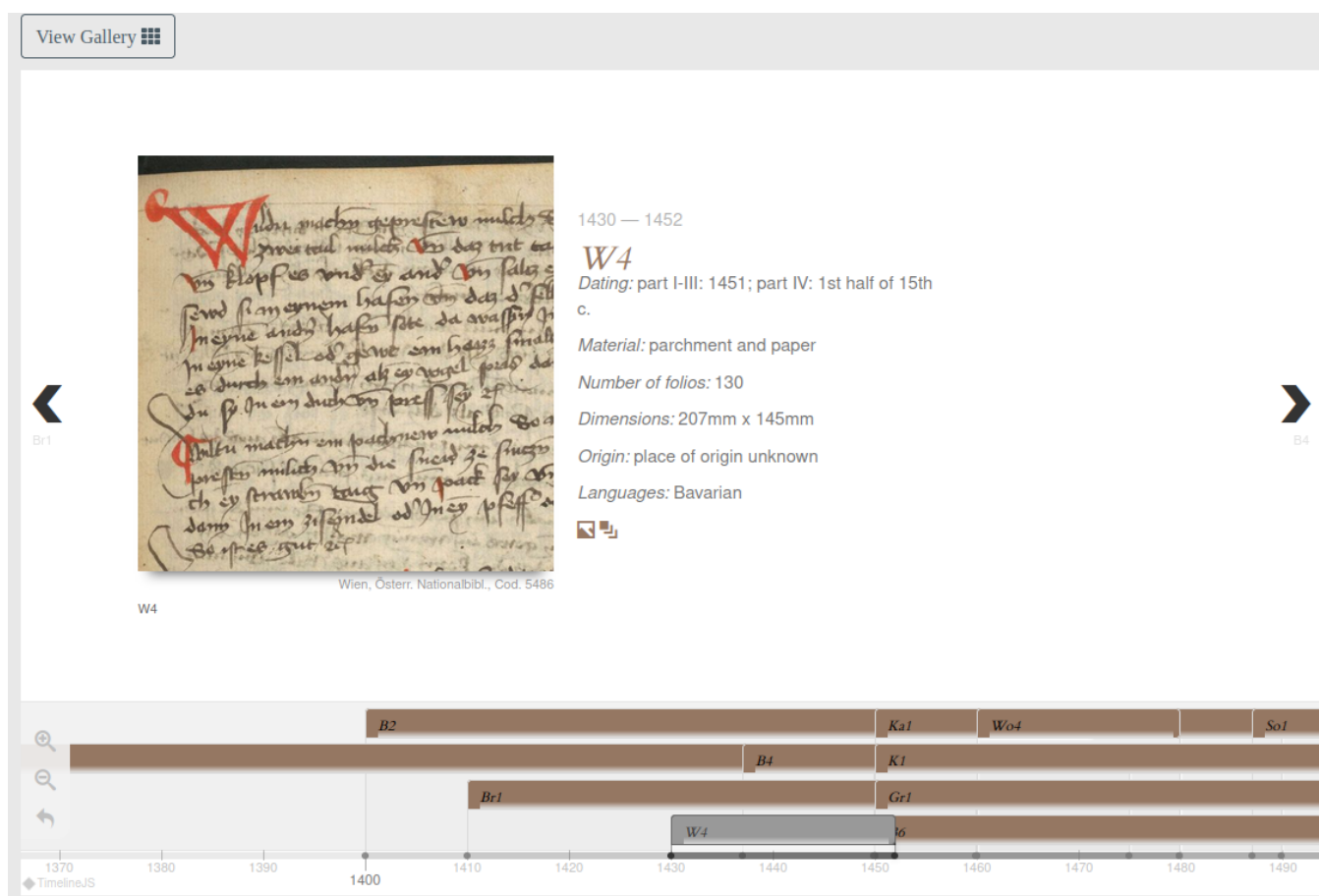
In the goals of the project, a development of an ontology to formalise the semantic annotation is mentioned. No information about this task is collected in the to-do list so it can be assumed that the list was conceived as a practical work document for the development of the portal and thus has little use for the more general tasks.

CoReMa's method: a transdisciplinary approach

CoReMa is presented by its creators as an interdisciplinary project, but I argue that the final result can be described as transdisciplinary: a cohesive unit of frameworks that surpasses the disciplinary perspectives (Jensenius 2012). In this sense, a scholarly digital edition is transdisciplinary by definition, but it is worth highlighting some of the other elements that interact to create a project as the one being reviewed. Thus, I will decompose what so smoothly comes together to provide an overview of some of the components of the project.

Material philology

For each manuscript of the collection, a codicological description is provided. The user can either access an overview of the edited manuscripts thanks to a timeline or a more 'traditional' description by selecting a specific manuscript.



One of the entries of the manuscript timeline.

The manuscript timeline is an excellent visualisation to examine the chronological framework of the project, especially useful when discussing a work in progress that will be frequently updated (as inferred by their to-do list). This timeline presents each manuscript in chronological order with a succinct codicological description (see Fig. 2). The visualized timeline is displayed below each description and each manuscript appears identified with its sigla in the corresponding time frame. As of April 2021, the timeline groups the

different manuscripts in four different lines (see Fig. 2). Although I could not find the specific documentation, as a reader I understand that the different lines represent branches of the manuscript tradition and manuscripts sharing the same line present a filiation relation.

In regards to the more thorough codicological description given for each manuscript, it should be noted that not all descriptions present the same level of detail, thus the available metadata varies from one artefact to the other. However, in general terms, this physical description includes a description of the support, containing information about the cover and binding, together with aspects of the *mise en page*.

The codicological analysis is complemented with bibliographic references. When possible, the link to a digital facsimile is included. The metadata provided for all manuscripts concerns the catalogue references with a Zotero link that enables the immediate import of any bibliographic reference.

The contents of the codicological description are mostly in German: all the available manuscripts come from libraries in German-speaking countries and the contents of this section are likely collected with the help of catalogues in German. Thus, the presence of German would be understandable if the contents were generated on the fly, but it does not seem to be the case. Nevertheless, if users can read the edition of the text in a historical Germanic variety, the manuscript description should not pose any problems.

Considering that the edition may involve just a very small portion of the codex, the detailed description of the manuscript, with all the references provided, renders a more accurate view of the artefact.

Paleography

The last part of this section is dedicated to the ecdotic component of the project in which the edition decisions will be further discussed. However, at this point it is pertinent to announce that the criteria of a digital documentary edition are already an inestimable source of palaeographic information (Pierazzo 2011, 475). This is even more straightforward when the transcription is always displayed next to a facsimile rendition of the folium, as it is the case in this project.

Besides the palaeographic knowledge that can be retrieved from the edition of these manuscripts that have different provenances (and thus, diverging writing practises), palaeographic metadata are given for each manuscript. As with the previous codicological description, the availability and detail of this information vary from one manuscript to the other, but all entries include the identification of the hands and of the script types. The most comprehensive palaeographic descriptions include an inventory of letterforms and specific graphical uses with their location in the manuscript.

Considering the particularities of the transmission of cookbooks, the identification of hands is crucial to identify the socio-historical context in which latter additions, comments or even modifications of the recipes are done.

Linguistics

Any scholarly edition of a medieval text requires a profound knowledge of the historic variants of the language under analysis. However, the semantic annotation of this project explicitly formalises part of that knowledge. At the moment, the semantic annotation not only consists of the description of the different parts of the recipe, like the opener, tips or instructions, but it also contains an under-the-hood standardisation of its contents. Certain elements like those which model the ingredients, the dish name or the cooking instrument

are given not only the English translation in an attribute, but the Wikidata identifier as well. The latter not only increases the interoperability of the dataset but it could also be used to disambiguate concepts for which English lacks specific terminology.*

In addition, access to historical socio-linguistic information is enabled through an interactive map of the linguistic varieties covered in the editions. The manuscript descriptions include the languages of the artefact, but through the map it is easier to approach the materials written in a particular variety.

Semantic Web technologies

As presented in the section 'Presentation of the project and its status', this part of the project is not fully implemented. It is worth mentioning, nevertheless, that certain steps were already taken, like the implementation of Wikidata identifiers to unambiguously map certain concepts. Even if no information is provided about the state of development of the ontology, a possible approach is to use the editions themselves to elicit the informational requirements of the ontology. In any case, even if the ontology is not fully implemented until a considerable number of texts is edited, it would be interesting to see how the different editions are linked to the ontology.* It should be noted that the project is stored in the open management system GAMS (Zentrum für Informationsmodellierung 2006-2021), an archive for managing, publishing and long-term archiving of digital resources from the Humanities. It provides the project resources with permanent identification and enriched metadata among other functionalities that can facilitate the implementation of semantic web technologies.

Textual scholarship: ecdotic model and text encoding

As stated in the objectives of the project, CoReMa's goal is to provide a philological edition of the source texts that follows a hyperdiplomatic transcription model (Klug and Böhm 2020). The theoretical framework of this editorial model is found in Hofmeister-Winter (2003). This model is being implemented in other ongoing edition projects at the University of Graz and this use backs up, in a way, CoReMa's choice (Klug and Laurioux 2020).

The specific advantages of this model in relation to the research questions and goals of the project are not explicitly addressed in the documentation. Even if the objectives of the project argue the need of providing scholarly curated texts, there is no specific discussion of the adequacy of the hyperdiplomatic model to CoReMa's particular goals. Details are given, however, about the implementation of this edition typology in the project *Mittelalterlabor** for which it is said that the moderately diplomatic criteria, with no normalisation, pursue the representation of writer specific features in the palaeographic dimension, together with 'text-genetic information, and dialectal markers that are represented on character level (e.g. sound changes, dialect markers)' (Klug and Laurioux 2020). It is inferred that similar goals are intended by the CoReMa project. Due to the conservative criteria, CoReMa's edition depicts a faithful representation of each of the witnesses. It should be noted that the same recipes are preserved in different witnesses and therefore a multi-witness critical edition of those recipes would shed light about their transmission. However, the comparison of recipes and the deeper analysis of recipe migration is not yet available, thus we need to wait to see what will be CoReMa's strategy to formalise and visualise the witnesses' comparison.

The actual implementation of the hyperdiplomatic model by CoReMa is very detailed: From the main menu we can access a thorough documentation in which the editorial criteria are exhaustively explained (Klug and Böhm 2020). Besides expounding how the structural elements are encoded, and how specific phenomena

should be treated (like abbreviations or punctuation marks), there is a detailed guide about character representation. They are following the guidelines of the *MUFI character recommendation* (Haugen 2015) and they present a list of common allographs and how they should be encoded. The criteria in this aspect are very conservative and the general norm is 'the text of the source is represented as detailed as feasible' (Klug and Böhm 2020). The documentation about the edition model ends with an explanation on how certain encoded information will be displayed.

Besides the general editorial guidelines, specific criteria may apply to certain manuscripts. In the description of each manuscript we might find 'encoding remarks' where these particular criteria are explained. Considering the heterogeneous sources (different languages, different periods, different writing traditions) it is appropriate to present these specific sections to reveal (and formalise) the idiosyncrasies of a particular manuscript.

In addition to the criteria concerning the representation of the primary sources, CoReMa provides their semantic annotation guide. In this valuable piece of documentation, they propose a very fine-grained segmentation of the recipes in semantic elements. Besides classifying the different types of recipes and their structural parts (like the opener or closer), it identifies the mentions to dishes, ingredients, tools, household tips, kitchen tips, serving tips, instructions, time spans and explicit health benefits.

The guide presents, on the one hand, the specific use of TEI elements and attributes needed to convey the semantics of the textual elements, and, on the other hand, the CoReMa-specific elements. The distinction between one type and the other is not always explicit. Nevertheless, the explanations are brief but clear with examples that illustrate very well the specific uses at hand.

The ingredients, dishes and tools are annotated with their Wikidata identifier, if possible. The lack of an identifier can be due to issues when interpreting a term (see Klug and Eibinger 2021a for an example) or because there is no equivalent item in Wikidata. The CoReMa team might consider creating the Wikidata entries themselves for some of the most obscure terms.*

There were only two minor aspects that could be reviewed in a future version. First, the presence of the element `<unclear>` in the semantic model description: it should solely belong, in my opinion, to the documentation about the editorial criteria. Second, the use of the attribute `@commodity` in the CoReMa-specific elements `<ingredient>`, `<dish>`, and `<tool>`. Considering the semantics of the attribute, it only seems appropriate in the last one of them. Also, the expected value is a Wikidata identifier, therefore, an attribute of the TEI classes `att.global-linking`, `att.canonical` or `att.identified` could be a more suitable candidate.

As stated in the documentation, 'all information relevant to the cooking process and related spheres (e.g. conservation) can be represented' (Eibinger and Klug 2020) and the level of detail formalised in the encoding scheme is indeed remarkable. The digital edition from the point of view of the graphical user interface will be described in the section 'The digital edition'.

Interface

Browse and search functionalities

The German Cooking Recipe Collection is accessible from a user-friendly, aesthetically pleasing interface (Klug et al. 2020). The front page (Fig. 1) presents an image of each edited manuscript (with its sigla) from which we can directly access its transcription or the description of that manuscript (Gallery view). This is a particularly convenient front page for recurrent visitors. Manuscripts that have already been semantically annotated present, in addition, the option 'Recipes'. This presentation is very convenient because one can access a specific manuscript immediately from the front page without having to perform any queries first. Just above the manuscript images, a secondary navigation bar offers five options to browse the manuscript collection with different views:

1. The first one presents a map of all the archives: clicking on one of the pinpoints displays a list of the manuscripts that are available from that archive.
2. 'View Dialect Map' displays a map with the dialects. By clicking on one of the dialect areas we can access the list of edited manuscripts written in that linguistic variety.
3. The timeline described above (see section 'Material philology') is accessible from this menu. Even if its function is not to be a chronological filter, but to explore the historical dimension of the collection, the contents of edited manuscripts can be accessed from here. This means that the timeline can be also used to select a manuscript from a specific time frame.
4. The option 'Indices' takes the user to a table of the recipes with a number of properties that can be used to filter its contents. In addition, there is a text field that filters the complete collection based on string match. Among the metadata fields available there is the name of the recipe (both in English and the original one), the witness, the archive and the provenance of the manuscript that contains the recipe, and the language. It is possible to toggle the different columns, to export the results, and to change the layout, displaying the recipes as cards instead of table rows.
5. The last one filters the manuscripts available in the 'Gallery view' by archive.

At the moment of writing, the project has edited almost 25% of the planned collection. This means that many of the archives or the dialects presented in the maps of options 2 and 3 have no representing manuscripts. A visual cue to differentiate the areas of both the dialect and archive maps that have no manuscripts would improve the user experience.

Besides the options given on the home page to browse the collection, the 'Analysis' tab on the main menu provides additional search functions. New analytical functions are expected to appear under this section in the future.

1. 'Fuzzy full-text recipe search': A text field (that allows wildcards) from which you can search the contents of any of the recipes targeting specific components of the recipe: the title, the full text, the tags or any field. The 'fuzzy' aspect of this search is a good approach to deal with the scripto-linguistic variants considering the corpus is not lemmatised.
2. 'Manuscript description search': A text field that allows wildcards. The search can be restricted to specific fields: title, full text or tags.
3. 'Advanced ingredient search': Two different types of search to filter the recipes depending on their ingredients. One of them is a text field that searches the English title of the recipe. The other is a faceted search with autocomplete function that allows you to see the possible ingredient combinations: after selecting one ingredient in a drop-down menu, another one that contains the ingredients with which the

selection shares a recipe appears. New drop-down menus will be presented until no more options are available. A small inconvenience is that these drop-down menus present the ingredients in a counter-intuitive case sensitive order. The results, that is, the list of recipes that match the search criteria, are exportable in CSV and PDF format and they contain the permanent URI and the title of each recipe.

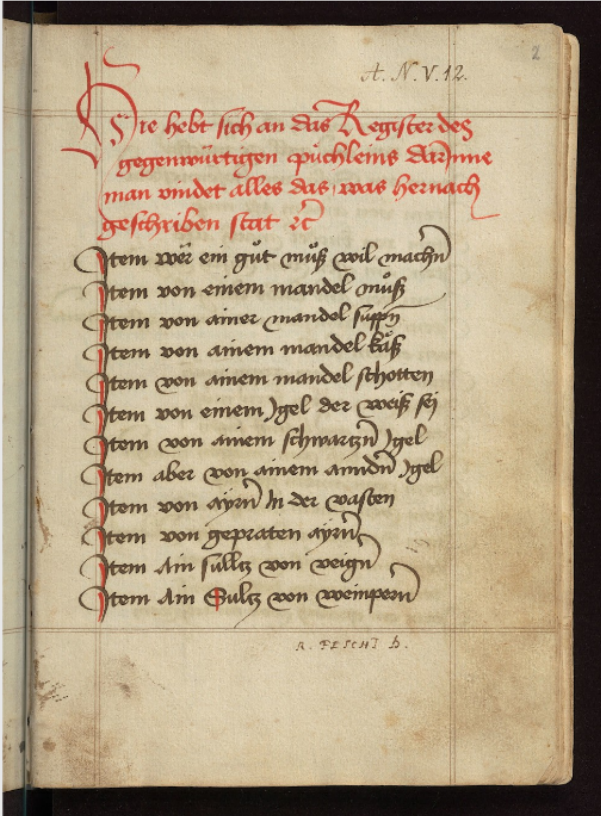
The digital edition

[2r]

- 01: Hie hebt sich an das Register des
- 02: gegenwürtigen puechleins darInne
- 03: man vindet alles das was hernach
- 04: geschriben stat etc.
- 05: Item wër ein gût müsz wil machen
- 06: Item von einem mandel müsz
- 07: Item von ainer mandel suppen
- 08: Item von ainem mandel kaesz
- 09: Item von ainem mandel schotten
- 10: Item von einem Igel der weisz sej
- 11: Item von ainem schwarczen Igel
- 12: Item aber von ainem anndem Igel
- 13: Item von aÿren In der vasten
- 14: Item von gepraten aÿren
- 15: Item ain sullcz von veigen
- 16: Item ain Sulcz von weinperen

[2v]

- 01: Item von ainem Seniff
- 02: Item von ainer gall ze machen
- 03: Item ain Sulcz von beenspactelen



Basel, UB Basel, AN V 12

Description
Recipes
Transcription
Full-Width
Metadata

Transcription view: hyperdiplomatic edition.

Once a manuscript is selected, the edited text is presented to the left of its facsimile, so it is easy to follow the transcription of each folio (Fig. 3). The images are of a great quality and navigation buttons facilitate the perusing of the facsimile. The folio number is clearly displayed each time a new page begins and lines are numbered. The edition documents the change of colours of the original. However, the text rendered in a brownish colour and italics indicates an abbreviation expansion. Hovering over the expansion fires a tooltip that informs us of the abbreviation mark that was expanded.

The only caveat of this edition might be the use of colour to encode two different types of information: ink use of the source and abbreviations. It might not be uncommon to find a decorated initial that contains an abbreviation, for instance, so one wonders which criterion would prevail.

At the bottom of the screen (Fig. 3), there is a menu with four tabs (five, if the manuscript is semantically annotated) that facilitates the navigation from the contents of one tab to the other. The first tab contains the manuscript description; if available, the tab 'Recipes' takes you to the results of the semantic annotation; the

tab 'Transcription' corresponds to the edited text; the 'Full-Width' one presents a display of the edition with a vertical layout: the facsimile appears on top and in a bigger frame than in the 'Transcription view'; and the last tab 'Metadata' provides very detailed metadata of the edition in different standards that are available for download.

***Pancake, stuffed with pears, apples and pork* (Nr. 27) [cooking recipe]** ¶¶

Ein fremder sin von praten NIm ein gepraten piern vnd roh sawr holzoeophel vnd gesoten sweisen vnderwachsen vleisch pheffer saffran aneis das pach alles vnd mach es waich vnd mit rohen ayren das es zusamen chlebn muag so mach dann ain plat von ayren vnd zu tail das condiment gleich dar auf wint das plat zu samen vnd zeuch ain ayren taig darvber pach es hert In smalcz stich das durch ein spis prat ez vnd beslach es mit ayren vnd mit smalcz wann es schuemt so ist es gar gesoten so gib es hin Man mag es spikchen als ain rechpraten er mag es wermen bey dem fewr das haist pieren praten

***Saddle of roe-deer* (Nr. 28) [cooking recipe]** ¶¶

Von dem rukpraten NIm den ruk praten von dem rech spikch den wol mit klainem spekch spreng In wol mit salcz wirf darauf Innwer pheffer chuem bewint In einen taig als chreph lein lasz in einem ofen pachen wart mit dem hecht aber gar gepachen sey also mach tu praten den hasen gancz

***Millet or groats roasted on a skewer* (Nr. 29) [cooking recipe]** ¶¶

Wie man hiers oder grews an einem spis pret NIm hiers vnd grewus slach ayr darczue das es dikch werd sneid in aus stekch in an ain spis prat in peslach in mit ayren gib in hin als mit andern condimenten

***Peas, roasted on a skewer* (Nr. 30) [cooking recipe]** ¶¶

Wie man arbais preat Slach arbais durch ein sib slach als vil ayr darczue pach sew mit einem klainem smalcz oder putern sneid sie zu stukchen pra sew an ainem spis beslach sie mit ayren vnd gib sew hin

***Pike skin, stuffed with pike* (Nr. 31) [cooking recipe]** ¶¶

Search...(wildcards: *?) 🔍 ⏴ ⏵ ✕

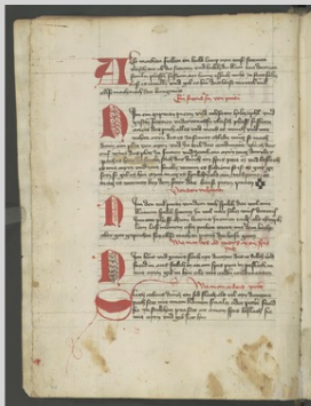
Ingredient Dish Tool Name

Instruction Opener Closer Ref.

Kitchen Tip Household Tip Serving Tip

Alt. Dietetics Time Date Note

🗨 ✕ = ✕



W1 - "Wien, Österr. Nationalbibl., Cod. 2897" ©

Recipes view: semantic annotation.

[17r]

***Puree* (Nr. 1)** *[cooking recipe]*

Wer ein **guot muos** wil haben das mach von sibennler sachen du muost haben milch salcz vnd schmalcz zugker ayer vnd mel **saffran dar zue So wirt es gell**

***Almond puree* (Nr. 2)** *[cooking recipe]*

Ain mandel muosz machen Item wildu machen ein mandel muoss So nym ein pfunt mandelss vnd nymm auch vmuedum vnd ob du des nicht hast So nym semlein prot dar zue vnd das thue In ain wasser vnd wall das darauss vnd das schlach mit der milch durch ain tuoch . So wirt es klain **wiltu es suess haben So thue zugker daran** das haist ain mandel muoss .

***Almond soup* (Nr. 3)** *[cooking recipe]*

Ain mandel suppen Item ain mandel suppen wiltu die machen die geet von mandel milch zue nymm ain semlein prot das paee

[17v]

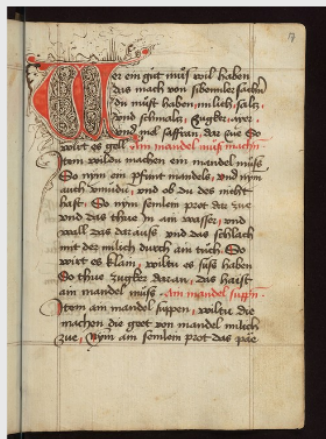
schon **die milch geuss daran wiltu die suppen haben** .

***Almond cheese* (Nr. 4)** *[cooking recipe]*

wiltu haben ain mandel kaeesz den mach also . Item wiltu haben ein mandelkaeesz So muost du haben ain haussen platter vnd zway pfunt mandel da machst du den kaeesz von vnd den mandel reib schon vnd schlah In durch ein weiss tuoch Nymm haussen platter ain lott des ist Im not die

Ingredient	Dish	Tool	Name
Instruction	Opener	Closer	Ref.
Kitchen Tip	Household Tip	Serving Tip	
Alt.	Dietetics	Time	Date Note

🗨 ✕ = ✂



Basel, UB Basel, AN V 12

📖 Description 👤 Recipes 📄 Transcription 🔍 Full-Width 🔗 Metadata

Visualisation of the semantic annotation: kitchen tips are highlighted in blue and serving tips are highlighted in light green.

If the text is semantically annotated, the recipes view is available (Fig. 4). Each one of the recipes is clearly identified and the locus with the folio number is provided. Each recipe has, as its heading, an English name for the recipe, and then in the edition its original title appears in bold. The English title is highlighted depending on the type of content of the recipe: for example, cooking recipes appear in green and kitchen tips in red. This categorisation is also made explicit in this heading. An icon at the end of the heading takes the user to the single recipe view (see Fig. 6 and description below). On the right side, we have a text field search that looks for specific contents in the edition and below it, a list of buttons with each of the semantic categories annotated. By clicking on one of these items, the textual fragments corresponding to that element are highlighted in the text (see Fig. 5 with an example).

A single recipe can be accessed either from the query in the 'Analysis' or the recipes overview. This presentation displays a slightly different layout than the views discussed above although it presents most of the same functionalities. Above the text of the recipe, we can find a text block that contains a list of the ingredients and tools mentioned in the recipe. Note that the list presents two types of ingredients, the base ingredients and what we might call 'intermediate ingredients', that is, the results of mixing some of the base ingredients before completing the dish. See as an example the presence of 'juniper berry broth' and 'sweet juniper berry broth' in the ingredient list of the recipe Klug and Eibinger (2021a). A differentiation between both types of ingredients could be practical.

CoReMA

Cooking Recipes of the Middle Ages

PARIS LODRON UNIVERSITÄT SALZBURG

université de TOURS

UNI GRAZ

Home

Analysis

Manuscripts

Editorial Model

Semantic Model

Project

To-dos

◀◀

Grape, sage, and garlic sauce

▶▶

Aber ein salsen

Ingredient

Dish

Tool

Name

Instruction

Opener

Closer

Ref.

Kitchen Tip

Household Tip

Serving Tip

Alt.

Dietetics

Time

Date

Note

Ingredients:

- spekch (bacon)
- saluay (common sage)
- knouloach haupt (garlic)
- weinper (grape)

Tools needed:

- No tools mentioned

Metadata:

Source Manuscript: W1

Recipe Nr. 264

Dating: part I (cooking recipe collection): mid-15th c., part III: mid-14th c.

Origin: possibly Augustinian canon monastery St. Dorothea Vienna

Lang: Bavarian, Medieval Latin

W1 - "Wien, Österr. Nationalbibl., Cod. 2897"

Aber ein salsen

Nim saur weinper vnd tue darczu saluay vnd ij knouloach haupt vnd spekch vnd stosz zusamen vnd trukch es aus vnd gibs fur ein salsen

Single recipe view.

Next to the ingredients and tools card, a summary of the recipes' metadata is presented (see Fig. 6). This description contains a link to both the hyperdiplomatic edition and the recipes view so as to see the current recipe in its context. To the right, we can see a facsimile view of the folio that contains the recipe and the list of buttons with the semantic elements that highlight the pertinent information.

Data sharing

As mentioned in the section 'Semantic Web technologies', CoReMa is managed via the GAMS system. Not only this guarantees the preservation of the project, especially in terms of data safety and integrity, but it is also an asset for data sharing strategies. From the edition of the witnesses (both from the transcription view and the recipes view) it is possible to access the metadata of the manuscript in different formats, all of them downloadable. The TEI file of every released version of the edition is provided together with the metadata in Dublin Core XML format. The fact that they supply an individual file for each version of the edition means that anybody interested only in the hyperdiplomatic edition, but not in the semantic annotation, can download directly the relevant file that matches their interest. It is possible that in the future other formats will be available for download, like an RDF serialisation.

The contents of the portal, including the edition and the facsimile images, have an explicit Creative Commons license (BY-NC-SA 4.0). 'How to cite' information is also available on each page and in every recipe, thus the dataset (and the documentation) of the project can be reused and easily credited.

Conclusion

This review analyses the edition of the German Cooking Recipe Collections of the CoReMa project. The CoReMa project has a very ambitious goal, a comprehensive understanding of the food habits in Medieval Europe, but the work so far done with this collection is an excellent proof of concept and a compelling showcase of their method.

CoReMa defends a cross-linguistic approach to overcome the possible deficiencies of national-based or monolingual methods that can hardly keep track of the intertextuality relations among recipes of different manuscript traditions. It will be interesting to see exactly the type of interrelations between recipes that will be studied and how they are going to be formalised and implemented. Nevertheless, considering the current use of semantic web technologies, and the future work planned, it is expected that an extended use of these technologies will be the preferred method to tackle this specific challenge.

Guided by a research question in food history, the philological approach is the cornerstone of the project. One of the most noteworthy features of the project is the semantic annotation. The semantic model is a fascinating reading in itself, and I am eager to see how it will be further put to use by the project. Their annotation schema goes beyond the mere identification of ingredients or dishes and it is indisputable that their annotated corpus will be relevant for adjacent disciplines to food history, such as the history of medicine or the philosophy of medicine.

Besides the current and future contribution of this project to food history, other disciplines will benefit from its corpus. Just as an example, together with all the heterogeneous linguistic information amenable to be retrieved from a digital documentary edition, the semantic annotation of the edition can be further exploited from a diachronic linguistics perspective. In this sense, I believe that the project resources could be exploited to study semantic shifts in food-related vocabulary; in addition, the fact that the corpus covers different linguistic varieties opens the door to historical socio-linguistic studies.

With transparent policies, thorough documentation and great usability, CoReMa is publishing a high-quality scholarly digital edition. As it is an ongoing project, its extensive functionalities will be even further enhanced.

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Figures

The front page of CoReMa including the menu items that describe this project.

One of the entries of the manuscript timeline.

Transcription view: hyperdiplomatic edition.

Recipes view: semantic annotation.

Visualisation of the semantic annotation: kitchen tips are highlighted in blue and serving tips are highlighted in light green.

Single recipe view.

Notes

This review was updated in April 2021 as the result of detailed peer-review that greatly improved its contents. The reviewer is a postdoc in Historical Linguistics and Digital Humanities at the University of Neuchâtel. She holds a PhD in Medieval Studies and, although the framework of her thesis project was philological, her postgraduate program was interdisciplinary and she holds a minor specialisation in Medieval History and Medieval Art History.

See Grocock and Grainer (2006, 116-20) for an overview of the transmission of this work showing its great success.

It has been covered in large-circulation periodicals or news media like the *BBC News* (Thomas 2017), *New York Times Magazine* (Wilson 2015) or *El País* (Pérez 2020).

For a more academic resource that is exclusively focused on the compilation of bibliographic references, scholars can consult *The Food Bibliography* ('The Food Bibliography' n.d.).

<https://web.archive.org/web/20210502085119/https://gams.uni-graz.at/archive/objects/context:corema/methods/sdef:Context/get?mode=todos>.

The English translations are provided using the corresponding Wikidata label, which might not always be the most intuitive translation of certain terms. See, for example, the recipe in Klug and Eibinger (2021a) where the label 'mus' in English is used to translate Bavarian 'Taig' (not to be confused with the standard German word for 'dough'). Even if the lemma 'mus' does not appear in English dictionaries like the OED, the Wikidata identifier (Q1953925) provides the user with the necessary information to interpret the term.

See for instance this discussion in the TEI Github repository: <https://web.archive.org/web/20201213212835/https://github.com/TEIC/TEI/issues/1860>.

<https://web.archive.org/web/20201214151226/http://gams.uni-graz.at/context:malab>.

See for example the English label 'trysenet' used in a few recipes like in Klug and Eibinger (2021d) but with the spelling 'trisenet' as the title of a recipe in Klug and Eibinger (2021c). Even if the term is well documented in historical and specialised dictionaries of German (Wörterbuchnetz 2020, 'trisenet'), no pertinent references to 'trysenet' in English were found online.

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